FLORA OF WEST TROPICAL AFRICA

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OF

WEST TROPICAL AFRICA

THE BRITISH WEST AFRICAN COLONIES, BRITISH CAMEROONS, THE FRENCH AND PORTUGUESE COLONIES SOUTH OF THE TROPIC OF CANCER TO LAKE CHAD, AND FERNANDO PO.

BY

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AND

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71. STERCULIACEAE

Trees or shrubs, often with soft wood, or very rarely herbs, mostly with stellate hairs. Leaves alternate, simple or digitately compound; stipules usually present. Flowers variously arranged, hermaphrodite or unisexual, actinomorphic. Sepals valvate, mostly partly connate or rarely spathaceous. Petals 5, or absent, contorted imbricate, often hooded. Stamens free or connate into a column, sometimes with staminodes; anthers 2-celled. Ovary superior, of 2–12 united carpels or of one carpel; ovules on axile placentas; style simple or rarely the styles free to the base. Fruit various. Seeds with or without endosperm and straight or curved embryo.

A large tropical family, with the stamens often united into a column; indumentum mostly stellate or lepidote; petals sometimes absent.

A common Indian tree, *Kleinhovia hospita* Linn., may occasionally be met with in cultivation in some parts of the area. We have seen a specimen collected at Kissy, Sierra Leone, by Major Litchford, in March, 1915 (*Lane Poole* Herb. No. 363). The leaves resemble those of *Bixa Orellana* Linn. (p. 157), and are very minutely pubescent on the veins below. Fruits pear-shaped, bladdery, 5-lobed, lobes winged; seeds rounded, markedly warty.

Flowers with petals, hermaphrodite :
- Staminodes present between the fertile stamens; mostly trees or shrubs :
  - Petals not hooded :
    - Calyx not spathaceous :
      - Bracteoles neither persistent nor enlarging in fruit :
        - Petals persistent, often becoming dry or scarious; fruit a loculicidal capsule — **1. Dombeya**
        - Petals falling off; carpels free in fruit, with a terminal wing — **2. Triplochiton**
      - Bracteoles persistent and enlarging in fruit, suborbicular .. .. — **3. Melhania**
    - Calyx spathaceous; carpels free in fruit, with a terminal wing; stamens and carpels at the top of a long androgynophore .. .. — **4. Mansonia**
  - Petals hooded :
    - Anthers solitary between the staminodes; fruits prickly, separate — **5. Buettneria**
    - Anthers several between the staminodes :
      - Anthers on long filaments; petals very small; staminodes slender; fruit a 3-valved capsule .. .. — **6. Leptonychia**
      - Anthers sessile; petals fairly large; staminodes broad; fruit capsular — **7. Scaphopetalum**
- Staminodes absent; mostly herbs or undershrubs :
  - Ovules numerous; capsule loculicidally 5-valved, apex often with horny appendages — **8. Hermannia**
  - Ovules 2 :
    - Ovary 5-celled; capsule loculicidally 5-valved; cells 1-seeded .. — **9. Melochia**
    - Ovary 1-celled; capsule 2-valved, 1-seeded .. .. .. — **10. Waltheria**

Flowers without petals, unisexual or polygamous; trees or shrubs :
- Anthers arranged in an irregular mass :
  - Calyx-tube comparatively short; fruits not membranous and inflated — **11. Sterculia**
  - Calyx-tube long; fruits inflated, submembranous .. .. — **12. Firmiana**
- Anthers arranged in whorls :
  - Fruits capsular, not winged :
    - Seeds not winged, few, without endosperm; fruits more or less oblong; leaves various .. .. — **13. Cola**
    - Seeds winged, numerous, with endosperm; fruits broadly oblong-ellipsoid; leaves broadly ovate .. .. — **14. Pterygota**
  - Fruits samara-like .. .. — **15. Tarrietia**

1. DOMBEYA Cav.—F.T.A. 1 : 226; K. Schum. in Engl. Monogr. Afr. Pfl. Fam. 5, *Sterculiaceae:* 18.

Flowers arranged in a subglobose rather dense head; branches, petioles and nerves below coarsely pilose with simple hairs; leaves digitately lobulate, cordate at the base, 12–20 cm. long, 10–17 cm. broad; stipules long-subulate-acuminate, loosely villous; sepals lanceolate, 1 cm. long, villous-pilose; petals 1·6 cm. long, about 1 cm. broad, not dry and hardened in fruit .. .. 1. *Buettneri*

Flowers in lax cymes; branches and petioles glabrous or nearly so; petals becoming dry and papery in fruit:

Flower-buds woolly-tomentose, obtuse; leaves openly cordate at the base, about 18 cm. long and 15 cm. broad, rigidly papery; sepals 7–8 mm. long, not reflexed; petals 1·5 cm. long; stipules arcuate-lanceolate, stellate-pubescent, soon falling off 2. *reticulata*

Flower-buds puberulous-tomentellous, apiculate; leaves rounded-ovate, closely cordate at the base, about 18 cm. long and 15 cm. broad, thinly papery; sepals 5–6 mm., early reflexed in fruit; petals 10–12 mm. long; stipules early caducous 3. *senegalensis*

1. **Dombeya Buettneri** *K. Schum.* in Engl. Bot. Jahrb. 15 : 133, and in Engl. Monogr. l.c. 27; Holl. 1 : 95. A weedy shrub with pithy branches, 7–15 ft. high; leaves with very long channelled petioles; flowers white with red centre, about 1 in. across, turning yellow in drying.
French Guinea: Faranah (Feb.)! Sierra Leone: Souradou (Jan.)! Togo: near Bismarckburg (Nov., Mar.)! Misahöhe (Nov.)! Gold Coast: Esslaman! Kumasi (Jan.)! Anum (Nov., Jan.)! S. Nigeria: Lagos Colony! Olokemeji! Ikom (Jan.)! Exsicc.—*Buettner* 345; 347. *Mildbraed* 7341. *Johnson* 553; 818. *Punch* 24. *Millen* 39. *Foster* 146. *Chev.* 20576; 20660. (See Appendix).
2. **D. reticulata** *Mast.*—F.T.A. 1: 228. *D. multiflora* var. *vestita* K. Schum. in Engl. Monogr. l.c. 34; Chev. Bot. 83. *D. atacorensis* A. Chev. A shrub like the last, 6–15 ft. high; leaf-nerves very prominent.
French Sudan: Kati (Jan.)! N. Nigeria: ? locality! Extends to Upper Nile and Uganda. Exsicc.—*Talb.* (no number). *Chev.* 176; 24314.
3. **D. senegalensis** *Planch.* in Fl. des Serres Sér. 1, 6 : 225. *D. multiflora* Mast. F.T.A. 1 : 227, partly, not of Planch.; K. Schum. in Engl. Monogr. l.c. 34, partly. A shrub like the preceding, flowering when leafless.
Senegal: ? locality! Gambia! Exsicc.—*Heudelot* 160. *Dawe* 43. *Dalz.* 8051.

2. TRIPLOCHITON K. Schum. in Engl. Bot. Jahrb. 28 : 330 (1900).

Leaves 5-lobed for about ⅓ of their length, lobes broadly ovate or triangular, averaging 10–15 cm. in diam., 5–7-nerved at the base, glabrous; petiole about ½ as long as the leaf; inflorescence rather few-flowered .. .. 1. *scleroxylon*

Leaves sub-7-lobed for about ⅓ their length, 7-nerved at the base, lobes oblong, averaging 15–20 cm. in diam.; petiole about ⅓ as long as the leaf; inflorescence many-flowered .. .. 2. *nigericum*

1. **T. scleroxylon** *K. Schum.* l.c. 331; Chev. Bot. 75. *T. Johnsonii* C. H. Wright—Holl. 1 : 104; Hook. Ic. Pl. t. 2758. A large tree with maple-like leaves, up to 120 ft. high and 5 ft. girth, buttressed at the base; flowering after fall of the leaves; flowers about 1 in. across when open, petals white, red-purple at base.
French Guinea: fairly common at the Niger sources and along the Liberian boundary. Ivory Coast: several localities (fl. Dec.–Mar.)! Gold Coast: common in the forest! Togo: in fringing forests, Misahöhe, etc. Dahomey: Sakété (Jan.)! Adjara (Jan.). S. Nigeria: Benin, Ojojwo! Abeokuta and Ondo forests. Also in French Cameroons and Spanish Guinea. Exsicc.—*Johnson* 813. *Chipp* 87; 450. *Foster* 188. *Chev.* 16105; 22819. (See Appendix).
2. **T. nigericum** *Sprague* in Kew Bull. 1909 : 212; Holl. 1 : 105. A large tree like the preceding, up to 150 ft., with similar flowers; buttresses reaching to 10–12 ft. from the ground.
S. Nigeria: Ijebu Ode (Jan.)! In forests, Abeokuta, Ondo, Owerri, Calabar! Exsicc.—*Punch* 125. *Foster* 370. (See Appendix).

3. MELHANIA Forsk.—F.T.A. 1 : 230.

A low shrublet; branches and leaves softly stellate-tomentose; leaves ovate-elliptic, rounded or truncate at the apex, subcordate at the base, about 3 cm. long and 1·5 cm. broad, crenate-serrate; stipules subulate-filiform, 3 mm. long, becoming glabrous; flowers axillary, solitary; bracteoles 3, much enlarged, membranous, and wing-like in fruit, about 3 cm. diam.; stamens 5, with alternating staminodes; fruit a small loculicidal capsule, 1–2-seeded .. .. 1. *Denhamii*

A low shrublet as above, but bracteoles linear-subulate and cells of fruit 3-seeded 2. *ovata*

1. **M. Denhamii** *R. Br.*—F.T.A. 1 : 230; Chev. Bot. 84. *Brotera bracteosa* Guill. & Perr. Tent. Fl. Seneg. 1 : 86, t. 17. A small shrublet woody at the base, the flowers enclosed in the large bracteoles.
Mauritania: Dikel (Dec.). Senegal: Walo and Cayor (Dec.–Mar.). Mauritania to India. Exsicc.—*Perrottet. Charles in Herb. Chev.* 25493.
2. **M. ovata** *Spreng.* Syst. 3 : 32. *M. abyssinica* Rich.—F.T.A. 1 : 231. *M. Leprieurii* Webb in Hook. Fl. Nig. 110, t. 4, 5.
Senegambia: St. Louis, Gandiole and Flour-à-Chaux. Sandy deserts in N. and S. Tropical Africa generally; also in India.

4. MANSONIA J. R. Drumm. in Journ. Linn. Soc. Bot. 37 : 260 (1905).

Branchlets and lower surface of the leaves softly pubescent or tomentose with stellate hairs; leaves obovate-orbicular, cordate at the base, slightly pointed, 15–30 cm. long, 8–15 cm. broad, thinly papery, crenulate-denticulate, 6–7-nerved at the base, with about 5 pairs of lateral nerves; stipules deciduous; cymes pedunculate, many-flowered; calyx spathaceous, densely stellate-tomentose, 1 cm. long, apiculate; petals obovate, nearly 1·5 cm. long; androgynophore nearly 1 cm. long; fruits winged, body 1·5 cm. long, obovoid, reticulate, wing unilaterally obovate-oblanceolate, about 6 cm. long .. .. *altissima*

M. altissima *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8 d : 138; Bot. 76. *Achantia altissima* A. Chev. A tree 70–100 ft. or more high, with white fragrant flowers and winged maple-like fruits.
Ivory Coast: several localities, in the forest (fl. Aug., fr. Nov.)! Gold Coast: Ashanti, Sunyani and Nkwanta (fr. Jan.)! Kumasi (fr. Oct.)! Exsicc.—*Chev.* 22281; B. 22345. *Chipp* 65; 72. *Brent.* 936. (See Appendix).

5. BUETTNERIA Linn.—F.T.A. 1 : 239.

A tree or shrub ; branchlets slender, stellate-puberulous ; leaves very long-petiolate, broadly ovate, widely truncate-cordate at the base, acutely acuminate, about 15 cm. long and broad, thin, entire, 5-nerved at the base, glabrous or nearly so ; flowers small in slender leaf-opposed cymes, sometimes with an additional sub-axillary smaller cyme ; cymes about as long as the petiole ; sepals lanceolate, 6 mm. long, finely tomentellous ; petals a little longer, linear-lanceolate, glabrous ; fruits spinose, about 3 cm. long (mature fruits seen only from Congo) .. .. *africana*

B. africana *Mast.*—F.T.A. 1 : 239.
Gold Coast : Agogo, in deciduous forest, young fr. (May) ! S. Nigeria : Oban ! Also in French Cameroons, Congo, Angola and ? in Uganda. Exsicc.—*Chipp* 443. *Talb.* 438 ; 1388.

6. LEPTONYCHIA Turcz.—F.T.A. 1 : 238.

Flowers axillary :
Sepals 1 cm. long, linear-lanceolate ; leaves oblong-elliptic or obovate-elliptic, rounded and often slightly unequal-sided at the base, long-caudate-acuminate, 12–18 cm. long, 5–8 cm. broad, thin, glabrous below, with 6–7 pairs of lateral nerves ; pedicels about 1 cm. long, jointed at the base, stellate-puberulous ; fruits subglobose, about 1·5 cm. diam., verrucose, tomentellous .. .. 1. *urophylla*
Sepals 4–5 mm. long, ovate-lanceolate, very thinly stellate-pubescent outside ; leaves elliptic or obovate-elliptic, broadly cuneate at the base, obtusely caudate-acuminate, 16–20 cm. long, 6–8 cm. broad, thin, glabrous below, with 6–8 pairs of lateral nerves ; pedicels 3 mm. long, jointed near the base .. .. 2. *Adolfi-Friederici*
Flowers on the older wood ; leaves long, usually over 30 cm. :
Leaves broadly oblong-elliptic, rounded at the base, caudate-acuminate, 13–14 cm. broad, with 7–9 pairs of lateral nerves ; pedicels 5 mm. long ; sepals linear-lanceolate, 8 mm. long, nearly glabrous ; fruits broadly obovoid, 1·5 cm. long, verruculose-tomentellous .. .. 3. *pallida*
Leaves elongate-oblong-oblanceolate, slightly rounded at the base, gradually acuminate, 6–7 cm. broad, with 6–7 pairs of lateral nerves ; pedicels 4 mm. long ; sepals broadly lanceolate, 5 mm. long, slightly pubescent ; fruits (young) obovoid, tomentellous .. .. 4. *lanceolata*

1. **L. urophylla** *Welw.*—F.T.A. 1 : 238 ; Chev. Bot. 86. *L. densivenia* Engl. & Krause. A shrub or small tree up to 20 ft. high, with white or yellowish flowers.
Sierra Leone : Kambui (Mar.) ! Bafi R. (fr. July–Aug.) ! S. Province (Feb.) ! Ivory Coast : Anoumaba, in forest (Nov.) ! Gold Coast : Juaben (Mar.) ! Dahomey : Allada, in forest (fr. Mar.) ! S. Nigeria : Idah ! Oban ! Ambas Bay (Jan.) ! Fernando Po ! Also in French Cameroons and Angola. Exsicc.—*Barter* 166 ; 3419. *Mann* 13. *Smythe* 215. *Dawe* 458 ; 522. *Johnson* 631. *Chev.* 23404. *Talb.* 604. (See Appendix).
2. **L. Adolfi-Friederici** *Engl. & K. Krause* in Engl. Bot. Jahrb. 48 : 556.
Fernando Po : south-west coast, near Bokoko (Oct.) ! Exsicc.—*Mildbraed* 6958.
3. **L. pallida** *K. Schum.* in Engl. & Prantl, Pflanzenf. Nachtr. 1 : 242. A shrub with pale green leaves ; branchlets puberulous.
S. Nigeria : Barombi ! Exsicc.—*Preuss* 313 ; 483.
4. **L. lanceolata** *Mast.*—F.T.A. 1 : 239. A shrub 12–15 ft. high, with pale leaves and glabrous branchlets.
Fernando Po (Jan.) ! Exsicc.—*Mann* 190.

7. SCAPHOPETALUM Mast. in Journ. Linn. Soc. Bot. 10 : 28 (1869).

Flowers borne on the older branchlets ; pedicels 2 cm. long ; petals 1·5 cm. long, lanceolate, acute ; leaves oblong-obovate, very long-caudate-acuminate, subacute at the base, 17–20 cm. long, 5–8 cm. broad, very reticulate on both surfaces 1. *macranthum*
Flowers on the young leafy shoots :
Leaves rounded at the base, elliptic, caudate-acuminate, 12–15 cm. long, 5–7 cm. broad, finely reticulate ; flowers axillary, very shortly pedicellate ; petals about 7 mm. long, obovate .. .. 2. *parvifolium*
Leaves more or less narrowed to or cuneate at the base :
Leaves oblong, obtusely cuneate at the base, abruptly long-caudate-acuminate, 10–18 cm. long, 4–6 cm. broad, thin, glabrous ; lateral nerves 9–10 pairs ; branchlets puberulous ; flowers fasciculate ; pedicels slender, 1–1·5 cm. long ; sepals oblanceolate, acute, 1·5 cm. long ; petals shorter, hooded .. .. 3. *Talbotii*
Leaves oblong or obovate-oblong, long-acuminate, 12–30 cm. long, 5–10 cm. broad, glabrous ; lateral nerves 9–10 pairs ; flowers fasciculate ; pedicels 5–6 mm. long ; sepals elliptic, acute, glabrous outside, 5–6 mm. long ; petals hooded ; fruit 3–3·5 cm. long, 1·5–2 cm. broad .. .. 4. *Blackii*
Leaves elongate-obovate, narrowed from above the middle to the base, up to 18 cm. long and 7 cm. broad, glabrous ; lateral nerves about 12 pairs ; flowers in very small axillary cymules ; pedicels 3 mm. long ; sepals shortly pubescent outside ; petals broadly boat-shaped, 6 mm. long .. .. .. 5. *amoenum*

1. **Scaphopetalum macranthum** *K. Schum.* in Engl. Monogr. Afr. Pfl. Fam. *Sterculiaceae* : 92, t. 6 B. A low shrub 3–5 ft. high, glabrous or slightly pubescent on the young branchlets.
S. Nigeria : Rio del Rey ! Also in French Cameroons. Exsicc.—*Johnston.*

2. **S. parvifolium** *Bak. f.* in Cat. Talb. Nig. Pl. 14. A small tree, up to about 30 ft. high, with slender almost glabrous branchlets; flowers yellow; petals strongly veined.
S. Nigeria: Oban, Obutong Road! Exsicc.—*Talb.* 1264.
3. **S. Talbotii** *Bak. f.* l.c. A small tree 20–30 ft. high; leaves rather thin; sepals dull red; petals ribbed, yellow.
S. Nigeria: Oban! Exsicc.—*Talb.* 1562.
4. **S. Blackii** *Mast.*—F.T.A. 1: 237. A shrub up to 10 ft. high.
S. Nigeria: Oban! Extends to Gabon. Exsicc.—*Talb.* 437; 1464.
5. **S. amoenum** *A. Chev.* Bot. 85, name only. Shrub 3–10 ft. high; flowers greenish outside, dark-purple inside.
Ivory Coast: Bingerville! Bouroukrou (Dec.–Jan.)! Sougan (Mar.)! Exsicc.—*Chev.* 15519, etc. (See Appendix).

8. HERMANNIA Linn.—F.T.A. 1: 232.

Herb, woody only at the base; stems ascending; leaves lanceolate or lanceolate-elliptic, subacute at each end, 2–6 cm. long, 1–2·5 cm. broad, loosely stellate-pubescent on both surfaces; petiole up to 1 cm. long; stipules linear-lanceolate, acute, 4–6 mm. long, often leafy; flowers axillary; pedicels very slender, 3–4 cm. long; calyx-lobes triangular-lanceolate, 1·5 mm. long, strongly nervose; fruits broadly turbinate, truncate and with several horns at the apex, 5–6 mm. long, loosely stellate-pubescent .. .. *tigrensis*

H. tigrensis *Hochst.*—F.T.A. 1: 233. A herb of farms, 1 ft. high, not common; flowers small, deep red.
N. Nigeria: Sokoto (Aug.)! Bauchi, Bichikki (Sept.)! Also in N. Cameroons, extending to Eastern Sudan, Abyssinia and Angola. Exsicc.—*Dalz.* 414. *Lely* 626.

9. MELOCHIA Linn.—F.T.A. 1: 235.

Flowers in terminal clusters; stems with lines of stellate hairs on the young parts; leaves ovate, rounded or very slightly cuneate at the base, acute, 3–6 cm. long, up to 4 cm. broad, 5-nerved at the base, nearly glabrous; petiole $\frac{1}{3}$–$\frac{1}{2}$ as long as the blade; bracts linear, ciliate .. .. 1. *corchorifolia*

Flowers axillary; petioles very short:

Stems and young parts densely covered with long silky hairs; leaves ovate-lanceolate, acute, rounded to truncate at the base, 4–8 cm. long, 2–3·5 cm. broad, pilose; petiole about $\frac{1}{4}$ as long as the blades; bracts very long-linear, densely plumose-pilose .. .. 2. *mollis*

Stems at most pubescent with rather short hairs:

Bracts about 1 cm. long; leaves ovate-lanceolate, pointed, 4–7 cm. long, 2–3 cm. broad .. .. 3. *bracteosa*

Bracts about 0·5 cm. long; leaves rather broadly ovate, scarcely pointed, 2–4 cm. long, about 1·5 cm. broad .. .. 4. *melissifolia*

1. **Melochia corchorifolia** *Linn.*—F.T.A. 1: 236; Stapf 582; Chev. Bot. 84. Herb or undershrub, 1½–2 ft. or more, with hollow stems, erect or sometimes prostrate; flowers small, white or sometimes yellowish or pinkish; more common in wet places.
Throughout tropical Africa and in India, etc. (See Appendix).
2. **M. mollis** *Hutch. & J. M. Dalz.* in Kew Bull. 1928: ined. *M. melissifolia* var, *mollis* K. Schum.; Stapf 582. Herb with axillary clusters of small white or yellowish flowers.
Liberia: Monrovia! S. Nigeria: Eket! Extends to Shari, Upper Nile and Uganda. Exsicc.—*Whyte. Talb.* (no number).
3. **M. bracteosa** *F. Hoffm.* Beitr. Fl. Centr.-Ost-Afr. 13. *M. melissifolia* var. *bracteosa* K. Schum. Habit of the preceding, up to 5 ft. high.
Sierra Leone: Kambia (Dec.)! Pujehun (Dec.)! Liberia: Gbanga! S. Nigeria: Lagos! Onitsha! Ibuzo (Nov.)! Ibadan! Okumi (Jan.)! Rio del Rey! Also in French Cameroons, Ubangi-Shari, Angola and Zanzibar. Exsicc.—*Sc. Elliot* 4351. *Barter* 1798. *Millen* 108. *Holl.* 176. *Johnston* (no number). *Schlechter* 12327. *Deighton* 268. *Linder* 1174.
4. **M. melissifolia** *Benth.*—F.T.A. 1: 236; Chev. Bot. 84. A branched, prostrate, woody weed, with small red or purplish flowers in axillary clusters.
Senegal! French Guinea: several localities. Sierra Leone: ? locality (Dec.)! Kennema (Nov.)! Liberia: Medina! Cinco! N. Nigeria: Bauchi Plateau, 3,000–4,600 ft. between Hepham and Ropp (July)! Vom! S. Nigeria: Ebute Metta (Mar.)! Exsicc.—*Heudelot* 564. *Sc. Elliot* 4163. *Dalz.* 1191. *Lely* 370. *Dent Young* 19. *Deighton* 395. *Linder* 1319.

10. WALTHERIA Linn.—F.T.A. 1: 235.

Straggling undershrub; leaves lanceolate to ovate-lanceolate, more or less broadly cuneate at the base, acute at the apex, 5–10 cm. long, up to 4 cm. broad, crenate, the younger leaves stellate-tomentellous, the older ones becoming less so; cymes axillary, sessile or stalked; bracts ovate, acuminate, 6–8 mm. long; shortly tomentellous .. .. 1. *lanceolata*

Erect herb woody at the base; leaves more or less ovate, rounded or subcordate at the base, obtuse or subacute, 5–10 cm. long, 2–6 cm. broad, rather closely serrulate-crenate, permanently stellate-tomentose below; cymes usually sessile; bracts linear-lanceolate, about 4 mm. long, villous .. .. 2. *americana*

1. **W. lanceolata** *R. Br.*—F.T.A. 1: 235; Chev. Bot. 85. *W. incana* A. Chev. Often scrambling on bushes, etc., in open places in forest.
Senegal! Gambia! French Guinea: Farana (Jan.)! Kouria (Oct.). Sierra Leone: Freetown, Heddle's Farm, etc. (Dec.)! Exsicc.—*Heudelot* 68; 692. *Brown. Sc. Elliot* 3906. *Poéguin* 377 bis. *Chev.* 20403. (See Appendix).
2. **W. americana** *Linn.*—F.T.A. 1: 235; Holl. 1: 95; Chev. Bot. 84. An erect grey-tomentose herb or undershrub, very common in open places. A widely distributed tropical weed. (See Appendix).

11. STERCULIA Linn.—F.T.A. 1 : 215 ; K. Schum. in Engl. Monogr. Afr. Pfl. Fam. 5, *Sterculiaceae :* 100.

Leaves digitately nerved and lobed, cordate at the base, lobes triangular-acuminate, up to 20 cm. long and broad, softly stellate-tomentose below, becoming less so with age ; flowers in short crowded cymes on the previous year's shoot ; sepals oblong-lanceolate, about 1 cm. long, tomentose outside ; fruits boat-shaped, 6 or more cm. long, very hairy inside ; seeds ellipsoid, slate-coloured, 10–14 cm. long, with a yellow fleshy aril at the base .. .. 1. *tomentosa*

Leaves pinnately nerved and entire :

Leaves stellate-tomentellous or pubescent below :

Leaves ovate-elliptic or slightly obovate, rounded at the base or slightly cordate, obtusely and shortly acuminate, 10–18 cm. long, 5–11 cm. broad ; petioles long ; flowers in pedunculate raceme-like cymes on the young shoots ; calyx-lobes lanceolate, about 3 mm. long, tomentose ; fruits broadly boat-shaped, about 7 cm. long, bristly-tomentose inside ; seeds oblong-ellipsoid, about 1·5 cm. long, slate-coloured, apparently not arillate .. .. 2. *Tragacantha*

Leaves elliptic, slightly cuneate at the base, more or less acuminate, 8–14 cm. long, 5–8 cm. broad, glabrous or nearly so above, thinly stellate-pubescent below ; lateral nerves about 12 pairs ; petioles rather short ; flowers few, in short racemes ; calyx-lobes about 5 mm. long, tomentellous .. .. .. 3. *elegantiflora*

Leaves glabrous below :

Leaves oblong or elliptic, much longer than broad :

Leaves more or less elliptic or oblong, shortly acuminate, rounded at the base, 7–14 cm. long, 4–8 cm. broad, with about 8–10 pairs of lateral nerves ; flowers in numerous axillary cymes much shorter than the leaves ; calyx divided to the base, lobes about 5 mm. long, woolly inside .. .. 4. *oblonga*

Leaves more or less oblong, scarcely acuminate, rounded at the base, 10–20 cm. long, 4–10 cm. broad, with 10–14 pairs of lateral nerves ; flowers in slender paniculate cymes accompanying the leaves ; calyx-lobes lanceolate, 4–5 mm. long, tomentose .. .. 5. *rhinopetala*

Leaves ovate-orbicular, nearly as broad as long, rounded or subtruncate at the base, shortly acuminate, 9–13 cm. long, 7–11 cm. broad, with about 5 pairs of lateral nerves very prominent below ; inflorescence not seen ; calyx-lobes elliptic, about 4 mm. long, very woolly .. .. 6. *Thompsonii*

1. **Sterculia tomentosa** *Guill. & Perr.* Tent. Fl. Seneg. 1 : 81, t. 16.—F.T.A. 1 : 217 ; K. Schum. l.c. 106 ; Holl. 1 : 90 ; Lely, 103 ; Chev. Bot. 77. *S. cinerea* Mast. F.T.A. 1 : 218, partly, not of A. Rich. A deciduous, savannah tree, 30 or more ft. high, bark rough, yielding a white gum ; young branches softly tomentose ; flowers dull red or yellowish-green with red streaks, appearing before the new foliage ; fruit pods usually 4–5, grey to brownish outside, beaked, velvety inside with pungent bristles along the placental line.
French Sudan : Bongouni ; Macina. Senegal : Bakel, not common. Gambia ! Gold Coast : Salaga ! Ejura ! Wa (Mar.) ! Togo : Sokode ! Dahomey : Agouagon ; Savalou. N. Nigeria : Nupe ! Ilorin (Mar.) ! Zungeru (Jan.) ! Agaie (Nov.–Mar.) ! Yola ! Musgu (Mar.) ! S. Nigeria : Okwe ! Extends to E. Sudan, Abyssinia, Tanganyika and Angola. Exsicc.—*E. Vogel* 98. *Barter* 1115 ; 1307. *Elliott* 28. *Dawe* 47. *Krause. Kitson* 887 ; 903 ; 910. (See Appendix).
2. **S. Tragacantha** *Lindl.*—F.T.A. 1 : 216 ; K. Schum. l.c. 102 ; Holl. 1 : 90 ; Chev. Bot. 77. A tree of the open parts or edges of forests ; up to 80 ft. high ; bole 30–40 ft., sometimes buttressed ; grey corky bark yielding a coloured gum ; conspicuous with red-purple flowers about Jan.–Feb. ; fruit bright red turning brown.
French Sudan : Banfara. Senegal ! French Guinea and Sierra Leone : several localities ! Ivory Coast : several localities ! Gold Coast : Accra ; Cape Coast ; Peki Plains (Jan.) ! W. Ashanti, Fiapere (Feb.) ! Adeambra ! Togo ; Lome ! N. Nigeria : Nupe ! Agaie (Feb.) ! S. Nigeria : Lagos ! Lagos Colony ! Benin (May) ! Ambas Bay (Feb.) ! Johann-Albrechtshöhe ; Victoria (Feb.) ! Fernando Po (Feb.) ! Extends to Ubangi-Shari, Congo and Angola. Exsicc.—*Heudelot* 657. *Lindley. Don. Sc. Elliot* 4465. *Smythe* 249. *Chipp* 84. *Barter* 1228. *Dawodu. Rowland. Mann* 759. *Unwin* 36. (See Appendix).
3. **S. elegantiflora** *Hutch. & J. M. Dalz.* in Kew Bull. 1928 : ined. *S. oblonga* A. Chev. Bot. 76, not of Masters. A tree.
Ivory Coast : several localities ! Exsicc.—*Chev.* 17693 ; 22316. (See Appendix).
4. **S. oblonga** *Mast.*—F.T.A. 1 : 216 ; K. Schum. l.c. 101. A tree, 50–90 ft. or more high, with glabrous leaves and branchlets ; fruit follicles 6 in. long, acuminate, very thick and hard-shelled, greyish in colour, with numerous compressed seeds nearly 1 in. long each completely enclosed in a yellow aril.
S. Nigeria : ? locality (young fr. Dec.) ! Fernando Po ! Also in French Cameroons, Gabon and Angola. Exsicc.—*Mann* 1162. *Foster* 369. (See Appendix).
5. **S. rhinopetala** *K. Schum.* l.c. 102 ; Holl. 1 : 90. *S. oblongifolia* A. Chev. Bot. 76. A large forest tree up to 100 ft. high ; leaves and branchlets glabrous except when quite young ; inflorescence small-flowered, 4–6 in. or more long, pale rusty-tomentose.
Ivory Coast : Morénou ! Gold Coast : Obuasi (Sept.) ! S. Nigeria : Ibadan Forest Reserve (Nov.) ! Ilaro ! Ifon ! Common in Oyo, Benin, Calabar and Abeokuta forests. Also in French Cameroons. Exsicc. —*Punch* (no number). *Vigne* 925. *Foster* 12. *Chev.* 22455. (See Appendix).
6. **S. Thompsonii** *Hutch. & J. M. Dalz.* in Kew Bull. 1928 : ined. A broad-leaved tree.
S. Nigeria : Western Province ! Exsicc.—*Thompson* 6.

12. FIRMIANA Marsigli in Act. Patav. 1 : 116, t. 1, 2 ; K. Schum. in Engl. Monogr. Afr. Pfl. Fam. 5, *Sterculiaceae :* 109, t. 10, fig. B.

Branchlets rather thick, glabrous ; leaves very broadly ovate-cordate, shortly acuminate, 15–25 cm. long and broad, very thin, about 7-nerved at the base, thinly pilose when quite young ; petiole up to 25 cm. long ; flowers in numerous slender panicles towards the ends of the branchlets ; calyx long-tubular, narrower in the middle,

FIG. 109.—FIRMIANA BARTERI *K. Schum.* (STERCULIACEAE).
A, longitudinal section of flower. B, pistil. C, longitudinal section of a carpel. D, anther from back. E, fruit. F, seed.

2 cm. long, minutely puberulous; lobes 5, lanceolate, acute, pubescent inside; stamens and carpels exserted; fruit broadly and obliquely inflated, submembranous, red, 7 cm. long, 3 cm. broad .. .. *Barteri*

F. Barteri *K. Schum.* in Engl. & Prantl, Pflanzenf. 3, 6 : 97; Holl. 1 : 91; Chev. Bot. 77. *Sterculia Barteri.* Mast.—F.T.A. 1 : 218; Oliv. in Hk. Ic. Pl. t. 2277. Tree, 80–100 ft. or more high, buttressed, with 30–40 ft. bole and girth up to 12 ft.; bark pale green; foliage poplar-like; flowers scarlet, appearing about Oct.–Nov., before the leaves.

Gold Coast: Ashanti, Dunkwa (fl. and fr. Dec.)! Agogo! Dahomey: Hollis country (fr. Feb.)! N Nigeria: Nupe! Bauchi Plateau, Vom, 3,000-4,500 ft.! S. Nigeria: common in the forests of Yoruba! Exsicc.—*Barter* 1085. *Rowland. Chipp* 603. *Vigne* 945. (See Appendix).

13. COLA Schott & Endl.—F.T.A. 1 : 220; K. Schum. in Engl. Monogr. Afr. Pfl. Fam. 5, *Sterculiaceae :* 110.

Leaves simple, not lobed or only very slightly trilobed :
Leaves narrowed to the base :
Stipules small, not more than 2 cm. long, often early caducous :
Leaves with fairly long petioles, 2·5 cm. or more long :
Leaves, especially when young, with rusty stellate hairs below, becoming glabrescent, oblong-elliptic, obtuse at the apex, 8–20 cm. long, 4–12 cm. broad; petiole remaining hairy at base and apex; flowers crowded in short axillary cymes, small, rusty-tomentose; calyx-lobes lanceolate, 5–6 mm. long; fruits obovoid, up to 5 cm. long .. .. 1. *laurifolia*
Leaves glabrous below from the beginning :
Stipules early caducous; leaves membranous; fruits long-beaked; seeds with a fibrous coat : for further characters see below .. .. 15. *heterophylla*
Stipules early caducous; leaves coriaceous; fruits not or shortly beaked; seed-coat not fibrous :
Leaves verticillate, obovate-elliptic to oblanceolate, acuminate, broadly cuneate to an obtuse base, 8–20 cm. long, about 4–7 cm. broad, reticulate below, about 6-nerved, the lowest pair of nerves at the very base; petiole tumid at the apex, up to 8 cm. long; flowers rather crowded, globose in bud and densely lepidote-stellate, at first subtended by a pair of concave bracts; cotyledons 3–5 .. .. 2. *verticillata*
Leaves very much as above but alternate or rarely subopposite :
"Seeds with 2 cotyledons"; fruit follicles broadly ellipsoid, often coarsely bullate-wrinkled, 8–12 cm. long, 5–7 cm. broad .. .. 3. *nitida*
"Seeds with more than 2 cotyledons"; fruits oblong-oblanceolate, nearly smooth, 12 cm. or more long, 5 cm. or more broad .. .. 4. *acuminata*
Stipules persistent, 5–8 mm. long, subulate; leaves opposite or in whorls, elongate-obovate, obtusely acuminate, 12–20 cm. long, 4–9 cm. broad, shining above; petioles variable, up to 7 cm. long; flowers fasciculate sometimes on the old wood, shortly pedicellate; calyx-lobes in the male flower 1 cm. long 5. *flavovelutina*
Leaves with very short petioles, not more than 1 cm. long :
Flowers on the younger leafy branchlets :
Leaves obovate, narrowed from the middle to the base, obtusely abruptly acuminate, 5–8 cm. long, 2–3·5 cm. broad, reticulate below; flowers axillary, fasciculate; calyx-lobes rusty-tomentose, 7 mm. long .. .. 6. *angustifolia*
Leaves oblong-elliptic, shortly narrowed at the base, obtusely acuminate, 6–12 cm. long, 2·5–4·5 cm. broad, reticulate below; flowers subsolitary and subsessile; calyx-lobes triangular, 4 mm. long .. .. 7. *Johnsonii*
Flowers on the older leafless branchlets, small on slender pedicels; leaves crowded elongate-obovate, obtusely acuminate, gradually narrowed to the base, 15–35 cm. long, 5–10 cm. broad, strongly reticulate on both surfaces, stipules linear-lanceolate, up to 2 cm. long .. .. 8. *cauliflora*
Stipules large and persistent, 3–3·5 cm. long; leaves long-petiolate, elongate-obovate, abruptly long-acuminate, 30–40 cm. long, 12–14 cm. broad, more or less glaucous below, reticulate; petiole tomentellous .. .. .. 9. *semecarpophylla*
Leaves rounded, truncate or cordate at the base :
Leaves oblong or oblong-elliptic, with a pair of pustular swellings at the base, cordate, abruptly acutely acuminate, 12–30 cm. long, 5–15 cm. broad, subulate, prominently veined below, ciliate and pilose on the nerves; flowers crowded in the upper axils, shortly pedicellate .. .. 10. *marsupium*
Leaves ovate or broadly ovate, often very large, without swellings at the base :
Leaves stellate-pubescent or tomentose below; flowers small and crowded, subsessile, densely tomentose .. .. 11. *cordifolia*
Leaves glabrous below; flowers larger on slender pedicels, slightly puberulous 12. *lateritia*
Leaves simple, more or less deeply digitately lobed and nerved :
Petiole very long, longer than the blade; blade rounded at the base, 3-lobed, up to

30 cm. long; lobes oblong, abruptly caudate-acuminate, up to 9 cm. wide, very strongly reticulate below; stipules persistent, linear-lanceolate, about 2·5 cm. long; flowers very small and subsessile .. .. .. 13. *ficifolia*

Petiole usually shorter than the blade; blade rounded or cordate or rarely subcuneate at the base, entire to 6-lobed, more or less gradually acuminate; stipules small and deciduous; flowers more or less pedicellate:

Petioles with long spreading hairs; seeds with a fibrous coat; leaves 5- or rarely 3- or 6-lobed, with spreading fulvous hairs on the nerves, lobes more or less ovate, acutely acuminate; flowers in very short cymes on the older woody branches .. 14. *caricifolia*

Petioles glabrescent or with short stellate hairs:

Fruits with long beaks; seeds with a fibrous coat; leaves very variable and thin, from obovate and entire to deeply 3-lobed, more or less gradually acuminate; flowers shortly cymose on slender pedicels .. .. .. 15. *heterophylla*

Fruits not beaked; seeds with a fleshy coat; leaves never entire, 3- or rarely 5-lobed, chartaceous, widely cordate to cuneate at the base, shortly acuminate; flowers shortly stalked or subsessile .. .. 16. *togoensis*

Leaves digitately compound:

Leaves densely lepidote below; leaflets obovate, gradually acuminate, up to 50 cm. long and 20 cm. broad, glabrous above, shortly stalked; flowers in short cymes, densely lepidote, about 1 cm. long, on long pedicels articulated in the middle 17. *lepidota*

Leaves not lepidote below:

All parts densely covered with long plumose hairs as well as short stellate hairs; leaflets pinnately lobed; obovate in outline, stalked, about 35 cm. long; flowers on the old wood, shortly pedicellate; calyx urceolate, ribbed, about 6 cm. long, about 2 cm. in diam. in the middle, lobes broadly triangular .. 18. *lanata*

All parts glabrous or at most only with short stellate hairs, sometimes petioles rather densely woolly:

Leaflets sessile, often pinnately lobed; flowers very large on the old wood, subsessile; calyx tubular, 7–8 cm. long, ribbed, finely stellate-puberulous; lobes triangular, 1·5 cm. long .. .. 19. *gigas*

Leaflets stalked, or if subsessile or sessile, then entire; flowers much smaller than above:

Leaflets or some of them pinnately lobed, stalked, obovate in outline, acutely acuminate, up to 40 cm. long, cuneate at the base, lateral nerves spreading flowers axillary, fasciculate; fruiting carpels long-stipitate, obliquely oblong, 6–8 cm. long, stellate-puberulous outside .. .. 20. *digitata*

Leaflets entire or nearly so:

Flowers borne on the older branches or stems; leaflets elongate-obovate, long-acuminate:

Leaflets sessile, elongate-oblanceolate, very acutely acuminate, long-attenuated at the base, up to 30 cm. long and 9 cm. broad, at first woolly on the midrib below; flowers clustered on the old wood, shortly pedicellate; calyx campanulate, 5-lobed, puberulous .. .. 21. *Talbotii*

Leaflets stalked:

Flowers long-pedicellate; pedicels 3–4 cm. long, jointed above the middle; calyx campanulate, lobes not membranous on the margin, minutely puberulous outside .. .. 22. *pachycarpa*

Flowers in short cymes; pedicels short, not jointed; calyx broadly campanulate, lobes not membranous on the margin, rusty-tomentellous outside; leaflets 5–6, elongate-oblanceolate, gradually acutely acuminate, 30 cm. long, 6–7 cm. broad; petioles up to 3 cm. long, fruits oblong, bluntly beaked, glossy, up to 14 cm. long .. .. 23. *Buntingii*

Flowers subsessile and subtended by an involucre of 3 concave bracts; calyx more or less turbinate, the lobes with thin margins, tomentellous outside 24. *chlamydantha*

Flowers axillary, accompanied by large ovate-lanceolate acuminate stipules about 3 cm. long; calyx subturbinate, lobes with thinner margins, tomentellous outside; pedicels rather short and stout; leaflets obovate-elliptic, very abruptly long-caudate-acuminate, 12–20 cm. long, up to 7 cm. broad, hairy on the midrib below .. .. 25. *rostrata*

1. **Cola laurifolia** *Mast.*—F.T.A. 1: 222; K. Schum. l.c. 115, fig. xlv., B; Chev. Bot. 80. *Sterculia laurifolia* A. Chev. Bot. 76, not of F. Muell. A medium-sized tree, common on stream banks; young branchlets and long-stalked leaves covered with loose rusty tomentum soon wearing off; stipules absent or inconspicuous; seeds 4 or 5 with a yellow coat.

French Sudan: Macina (fr. Sept.)! Kerfomouria; Upper Volta; Gourma. French Guinea: Kouroussa! Sierra Leone: Falaba (Mar.)! Ivory Coast: confluence of Sassandra and Bafing R. Togo: Katscha stream! Dahomey: Ouémé R.; Atacora Mts., N. Nigeria: Nupe! Lokoja! Abinsi! S. Nigeria: Lagos! Lagos Colony! Ogun R.! Exicc.—*E. Vogel* 202. *Barter* 190, 1304. *Sc. Elliot* 5292. *Millen* 138. *Rouland.* *Poheguin* 670. *Kersting* A 563. (See Appendix).

2. **C. verticillata** *Stapf* ex *A. Chev.* Vég. Util. Afr. Trop. Fr. 6 : 136 (1911) ; Chev. Bot. 83. *Sterculia verticillata* Schum. & Thonn. *Cola anomala* K. Schum. l.c. 134. t. xvi. B. A tree, up to 75 ft. high, with bole up to 25 ft. without branches ; shining subcoriaceous leaves spreading almost at right angles to the branchlets ; stipules linear, acute, ½ in. long, soon falling off ; flowers yellowish, pubescent inside and with purple markings ; flowering July–Aug. and Jan.–Feb., fruit (about Nov.) 4–5 in. long, 1½–2 in. broad ; seeds up to 9 or more per carpel, white or red, with 3–5 cotyledons, edible.

Ivory Coast : Dabou (? planted) ! Gold Coast and Ashanti forests to S. Nigeria and Cameroons, and Portuguese Congo ; cultivated in Nupe District, N. Nigeria ! Habitat in swampy forests and by streams. Exsicc. *Johnson* 485 ; 640 ; 1051–1052. *Thompson* 75. *Foster* 193. *Yates* 41 ; 53. *Jolly* 7. (See Appendix).

3. **C. nitida** *A. Chev.* Vég. Util. Afr. Trop. Fr. 6 : 120 (1911) ; Chev. Bot. 81, incl. vars. *Sterculia nitida* Vent. Jard. Malmaison sub t. 91. *Cola vera* K. Schum. l.c. 124, fig. 2. *C. simiarum* Sprague ex Lane-Poole, Trees, Shrubs, etc., of Sierra Leone, 25, name only.

French Guinea to Nigeria, frequently cultivated. Owing to the fact that this is distinguished from *C. acuminata* by the number of cotyledons, we are unable to quote herbarium specimens for either species with any degree of accuracy. There appear to be numerous cultivated races which are not distinguishable in a herbarium. A full account will be found in A. Chevalier " Les Kolatiers " in Vég. Util. Afr. Trop. Fr. fasc. 6 (1911). (See Appendix).

4. **C. acuminata** *Schott & Endl.*—F.T.A. 1 : 220, partly ; K. Schum. l.c. 125, fig. 3, incl. vars. ; Holl. 1 : 91 ; Chev. Vég. Util. Afr. Trop. Fr. 6 : 129 ; Chev. Bot. 77. *Sterculia acuminata* Beauv. Fl. Owar. & Benin, 1 : 41, t. 24.

Distributed in a wild state from Nigeria to the Gabon, and introduced and sometimes naturalised from Liberia to Angola. See note under *C. nitida*. (See Appendix).

5. **C. flavovelutina** *K. Schum.* in Notizb. Berl. Bot. Gart. 2 : 306 (1899), and l.c. 116, t. 15, c. *C. cauliflora* Mast. F.T.A. 1 : 221, partly. *C. reticulata* A. Chev. Bot. 83, name only. *C. arcuata* Baker f. A shrub or small tree, 10–20 ft. ; flowers golden-red pubescent.

French Guinea : near Mt. Nzo. S. Leone : ? locality ! Gola forest ! Ivory Coast : Upper Nuon, foot of Mt. Nouba ! S. Nigeria : Oban ! Also in French Cameroons and Gabon. Exsicc.—*Unwin & Smythe* 53. *Talb.* 29 : 31 ; 1266 ; 1344. Chev. 21105.

6. **C. angustifolia** *K. Schum.* in Engl. Monogr. l.c. 115. *C. Rolandi-Principis* A. Chev. Bot. 83, name only. A tree with glabrous subcoriaceous leaves ; fruit follicles almost spherical, orange-red, pointed, up to 1½ in. long, seeds black.

Sierra Leone : ? locality ! Kessewe Hills (Apr.) ! Exsicc.—*Afzelius*. *Lane-Poole* 119. (See Appendix).

7. **C. Johnsonii** *Hutch. & J. M. Dalz.* in Kew Bull. 1928 : ined. " A small tree, with waxy yellow flowers," stipules lanceolate ; subulate, ½ in. long.

Gold Coast : Kwahu, 2,000 ft. (Mar.) ! Exsicc.—*Johnson* 619.

8. **C. cauliflora** *Mast.*—F.T.A. 1 : 221 ; K. Schum. l.c. 117. *C. micrantha* K. Schum. A shrub or small tree, 10–20 ft. high, branchlets glabrous, with rough, grey bark ; flowers red-brown-pubescent on pedicels of ½–1 in.

S. Nigeria : Oban ! Ambas Bay (Feb.) ! Johann-Albrechtshöhe. Extends to Gabon. Exsicc.—*Mann*. 772. *Talb.* 188. *Staudt* 603.

9. **C. semecarpophylla** *K. Schum.* in Notizb. Berl. Bot. Gart. 2 : 306 (1899) ; and l.c. 117, t. 11 A. A small tree, up to about 20 ft. high, young branchlets and petioles woolly-tomentose ; stipules linear, curved ; flowers red, small, abundant, on the old wood.

S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Talb.* 1585.

10. **C. marsupium** *K. Schum.* in Engl. Monogr. l.c. 113, t. 12, A–D. A shrub or small tree up to about 30 ft. high ; branchlets, long petioles and nerves of the leaves brownish-hispid ; stipules filiform, hispid, 1–1·5 cm. long ; flowers yellowish ; fruits cylindric, up to 3 in. long, slightly transversely constricted.

S. Nigeria : Oban ! Johann-Albrechtshöhe, undergrowth in lighter places of forest (Jan.) ! Also in French Cameroons, Gabon and Congo. Exsicc.—*Talb.* 24, 1338. *Staudt* 519.

11. **C. cordifolia** *R. Br.*—*Sterculia cordifolia* Cav.—F.T.A. 1 : 217 ; K. Schum. l.c. 132, t. 16, A. A large forest tree, up to 100 ft., with spreading crown and buttressed trunk ; the bark strips like that of the plane ; stipules ovate-oblong, acuminate, early caducous ; inflorescence yellow ochry tomentose, flowers March–April and also November–January ; fruit follicles scarlet, tomentose outside, smooth inside, woody with a recurved beak 5 in. long by 3 in. broad ; seeds with a fleshy coat.

From Senegal to Cameroons, the southern part of the Eastern Sudan and Uganda ; chiefly in forest but extending in ravines, etc., into the savannah. Exsicc.—*Heudelot* 82. *Sc. Elliot* 4750. *Dawe* 7 ; 62. *Pirie* 45. *Chipp* 564. *Dalz.* 8053. *Yates* (no number). *Moloney*. *Talb.* 3046. *Krause*. *Baumann* 431. *Mildbr.* 7316. (See Appendix).

12. **C. lateritia** *K. Schum.* in Notizbl. Berl. Bot. Gart. 2 : 305 (1899) and l.c. 131 ; var. *nigerica* Bak. f. in Talb. Cat. Nig. Pl. 13. *C. leonensis* Hutch. ex Lane-Poole, Trees, Shrubs, etc., of Sierra Leone, 25, name only. A tree up to 60 ft. ; indumentum almost scaly-stellate ; leaves and stipules more or less as in the last ; leaves on the young branches often 7-lobed ; flowers yellow or brick-red ; fruit red, rugose, 2–3 in. long, seeds 4–6, surrounded by a fleshy pulp.

Senegal : ? locality ! Ziguinchor (May) ! Sierra Leone : Sinjo (Feb.) ! Bumbuna (Oct.) ! Liberia : Gbanga (Sept.) ! Gold Coast : Swedru ! Anyinam (July) ! Dunkwa (fr. Oct.) ! Togo : Misahöhe (Nov.) ! S. Nigeria : Oban, Itaiyo River ! Johann-Albrechtshöhe ! Also in French Cameroons. Exsicc.—*Perrottet* 87. *Leprieur*. *Lane-Poole* 144. *Dalz.* 8257 ; 8286. *Unwin & Smythe* 20. *Talb.* 1313. *Brent* 774. *Linder* 537. *Mildbr.* 7209. *Staudt* 510. (See Appendix).

13. **C. ficifolia** *Mast.*—F.T.A. 1 : 223 ; K. Schum. in Engl. Monogr. l.c. 118. *C. Preussii* K. Schum. *Schubea heterophylla* Pax (as to leaves only). A small tree about 20 ft. high ; branchlets rufous-tomentose when young ; flowers in dense axillary clusters.

S. Nigeria : Victoria ! Barombi ! Fernando Po ! Exsicc.—*Mann* 1157. *Preuss* 1330 (as to leaves). *Preuss* 394.

14. **C. caricifolia** *K. Schum.* l.c. 111, t. 11B ; Chev. Bot. 78. *C. Afzelii* Mast.—F.T.A. 1 : 223. A tree, up to about 30 ft. ; branchlets rusty-bristly when young ; leaves 4–9 in. long and broad ; inflorescence rusty-downy ; fruit follicles crimson, about 2 in. long, 8–10-seeded, seeds with a fibrous coat.

Sierra Leone : Kukuna, Scarcies R. (Jan.) ! Limba country ! Mayoso (Aug.) ! Ivory Coast : Bouroukrou (Dec.–Jan.), Grabo (July). S. Nigeria : Onitsha ! Oyo forests ! Oban ! Extends to Gabon. Exsicc. —*Afzelius* (not seen). *Oldfield* 8. *Barter* 1306 ; 1774. *Sc. Elliot* 4514. *Shaw* 42. *Thomas* 1385 ; 1449. *Talb.* 1341. (See Appendix).

15. **C. heterophylla** *Schott & Endl.*—F.T.A. 1 : 223 ; K. Schum. l.c. 118 ; Chev. Bot. 80. *C. brevipes* K. Schum. A tree with leaves both simple and lobed ; flowers yellow ; with red streaks, tomentose outside ; fruit crimson, sharply ribbed, 3–5 in. long including the beak, ½–¾ in. broad.

Senegal ! French Guinea : Farana ; valley of the Kaba ; Kouria. Sierra Leone : Gola forest (fr. Jan.) ! ? locality ! Kennema ! Liberia : Monrovia ! Gbanga (Sept.) ! Peahtah (fr. Oct.) ! Ivory Coast : Nzi valley. Gold Coast : W. Apollonia, Ankassa (Aug.) ! S. Nigeria : Epe ! Abeokuta ! Lagos ! Warri District ! Degema ! Oban ! Calabar (fr. Feb.–May) ! Also in French Cameroons and Portuguese Congo. Exsicc.—*Heudelot* 720. *Barter* 3304. *Irving* 106. *Mann* 2286. *Rowland*. *Lane-Poole* 464. *Unwin & Smythe* 54. *Chipp* 328. *Thomas* 7897. *Talb.* 1566 ; 1587 ; 3741. *Kalbreyer* 206. *Linder* 583 ; 595 ; 1071.

16. **C. togoensis** *Engl. & Krause* in Engl. Bot. Jahrb. 45 : 331, fig. 2 (1911) ; Chev. Bot. 83. *C. Millenii* K. Schum. A tree of fringing forests, 30–60 ft. high ; young branchlets and inflorescence rusty-tomentose ;

leaves 10–20 cm. long; flowers in dense axillary clusters, calyx-tube red inside, brownish outside; fruit follicles ellipsoid or ovoid, grooved, 2–4 in. long, red, glabrous when ripe; seeds about 1 in. long, with a pale yellowish coat.

Ivory Coast: Morénou (Nov.)! Gold Coast: Aburi Hills! Ejura! Akim (Dec.)! Togo: Sudu (fr. May). Misahöhe (Nov.)! Lome! Dahomey: Porto Novo; Savalou. S. Nigeria: Epe! Ebute Metta! Ikoyi (Jan.)! Ibadan forest (Nov.)! Degema! Also in French Cameroons. Exsicc.—*Barter* 3307. *Millen* 29; 31. *Johnson* 270. *Punch* 136. *Dalz.* 1389; 8260. *Talb.* 3671. *Chev.* 22450. *Warnecke* 414. *Mildbraed* 7263. *Kersting* A. 717. (See Appendix).

17. **C. lepidota** *K. Schum.* l.c. 121, t. 13. A tall shrub or tree up to about 40 ft. high, young shoots scaly, later glabrous; leaves long-stalked, 3-foliolate; stipules lanceolate, subulate, up to 1 in. long, early caducous; flowers clustered on the older wood; calyx-lobes dark purple inside, scaly outside, with a membranous margin towards the apex; fruit follicles about 8 in. long by 2 in. broad, subcylindric, shortly acuminate, roughly scaly; seeds smooth, brownish, naked.

S. Nigeria: Oban! Rio del Rey! Barombi (Oct.)! Johann-Albrechtshöhe (Apr.)! Also in French Cameroons and Gabon. Exsicc.—*Talb.* 124; 1382; 1570. *Johnston. Preuss* 43. *Staudt* 925; 936.

18. **C. lanata** *Bak. f.* ex *Hutch. & J. M. Dalz.* in Kew Bull. 1928: ined. A medium-sized tree, with long-stalked leaves and urn-shaped dark red flowers arising from the stem.

S. Nigeria: Oban! Exsicc.—*Talb.* 160 partly; 1299.

19. **C. gigas** *Bak. f.* in Talb. Cat. Nig. Pl. 10, t. 3, 1–4. A tree 30–40 ft. high; leaflets 4–5, about the same size as in the preceding, and larger flowers.

S. Nigeria: Oban (Oct.)! Exsicc.—*Talb.* 160 partly.

20. **C. digitata** *Mast.*—F.T.A. 1: 224; K. Schum. l.c. 123: Chev. Bot. 79. *C. schizandra* Bak. f. A glabrous shrub or small tree, 12–15 ft. high, leaves long-stalked, leaflets 5–7; fruit follicles crimson, hard and leathery.

Liberia: Monrovia! Ivory Coast: Alépé; Sanvi; Tébo. S. Nigeria: Oban! Also in French Cameroons, Princes and St. Thomas Islands, and Gabon. Exsicc.—*Whyte. Talb.* 1244; 1598.

21. **C. Talbotii** *Baker f.* l.c. 11. A tree; leaves long-stalked with 5 leaflets; flowers about ½ in. long, dark red; fruit follicles about 4 in. long, reddish.

S. Nigeria: Oban; Kwa River! Exsicc.—*Talb.* 4.

22. **C. pachycarpa** *K. Schum.* l.c. 122, t. 12, E–H. A forest tree up to 30 ft. high, little-branched, flowering even in a shrubby condition; leaves long-petioled with 7–9 leaflets, 6–12 in. long, on petiolules of ¾–2 in.; stipules linear-lanceolate, 1 in. long; flowers ¾–1 in. long, pale red; fruit follicles stout, ellipsoid, dark brown, rather smooth, 8 in. long, 4 in. wide; seeds with a thick yellowish waxy coat.

S. Nigeria: Oban! Barombi (fl. Mar., fr. Aug.)! Also in French Cameroons and Congo. Exsicc.—*Talb.* 1738. *Preuss* 22; 370.

23. **C. Buntingii** *Bak. f.* l.c. 12. A tree about 20 ft.; leaves long-stalked; flowers about ½ in. long; fruit follicles "pinkish-red and glossy."

Liberia: Begwai Bush (Sept.)! Exsicc.—*Bunting.*

24. **C. chlamydantha** *K. Schum.* l.c. 112. A small forest tree about 25–30 ft. high; leaves on long stout petioles; leaflets 7, up to 18 in. long and 6 in. broad; flowers deep red.

Liberia: Du River (Aug.)! S. Nigeria: Oban! Also in French Cameroons. Exsicc.—*Talb.* 6; 1645. *Linder* 290.

25. **C. rostrata** *K. Schum.* in Engl. Bot. Jahrb. 33: 314. A tree, 18–25 ft. high; branchlets, long petioles and inflorescence rusty brown subtomentose; leaflets 5, subsessile; flowers yellow or red.

S. Nigeria: Degema! Oban! Also in French Cameroons. Exsicc.—*Talb.* 1626; 3244; 3642.

14. PTERYGOTA Schott & Endl. Melet. 32 (1832).

Branchlets thick; leaves ovate-orbicular, entire or slightly lobed, acuminate, deeply cordate at the base, up to 25 cm. long and 20 cm. broad, rigidly papery, minutely lepidote when young, finely reticulate below, strongly 5–7-nerved at the base; petiole ⅛ as long as the blade; flowers few, in terminal cymes; sepals lanceolate, obtuse, 2 cm. long, 5–6 mm. broad, densely stellate-tomentellous; fruits broadly ellipsoid, about 15 cm. long; seeds numerous, with a broad oblique oblong wing about 11 cm. long .. .. *macrocarpa*

P. macrocarpa *K. Schum.* in Engl. Monogr. Afr. Pfl. Fam. 5, *Sterculiaceae*: 135, fig. 1, A–B. A large tree with bole 50 ft. or more without branches, 8–10 ft. in girth, buttressed at the base; branchlets rough with leaf scars.

Ivory Coast: Morénou (Nov.)! Indénié. Gold Coast: W. Ashanti, Nkawe (fr. Mar.)! S. Nigeria: Olokemeji! Abeokuta forests. Victoria! Exsicc.—*Chipp* 143. *Corbin* 522. *Chev.* 22462. (See Appendix).

15. TARRIETIA Bl. Bijdr. 227 (1825).

Leaves digitately 5–7-foliolate, or by reduction the upper leaves 1-foliolate, long-petiolate; leaflets elongate-oblanceolate or oblong-elliptic, caudate-acuminate, cuneate at the base, 10–20 cm. long, 3–7 cm. broad, glabrous and with a raised midrib above, densely lepidote below; lateral nerves 10–15 pairs; flowers numerous in axillary panicles; calyx-lobes narrowly lanceolate, subacute, 3 mm. long, softly stellate-tomentellous; fruits unilaterally winged; body ellipsoid, 2·5 cm. long, wing about 7 cm. long and 3 cm. broad .. .. *utilis*

T. utilis *Sprague* in Kew Bull. 1916: 85. *Triplochiton utile* Sprague in Kew Bull. 1908: 257. *Cola proteiformis* A. Chev. Bot. 83. *Heritiera utilis* Sprague in Kew Bull. 1909: 348. A large forest tree 75–90 ft. high, with bole 40–60 ft. and flying buttresses which separate from the trunk shortly below the point at which they are given off; leaves coriaceous, simple on seedlings in the first year and on the flowering twigs, otherwise digitate; winged fruits 2–5 together.

Sierra Leone: common in forests (Oct.)! Liberia. Ivory Coast: Azagulé (Sept.)! Abidjean. Alépé. Gold Coast: forests of the Colony and Ashanti (Mar.)! Exsicc.—*Thompson* 1; 25. *Chipp* 204; 210. *Lane-Poole* 399. *Aylmer* 254. *Chev.* 22293. (See Appendix).

72. BOMBACACEAE

Trees with sometimes bulging stems through excess of water storage. Leaves simple or digitate, alternate, often lepidote; stipules deciduous. Flowers hermaphrodite, large and showy. Calyx closed and valvate in bud, often with

FIG. 110.—TARRIETIA UTILIS *Sprague* (STERCULIACEAE).

A, flowering shoot. B, leaf. C, flower laid open. D, pistil. E, carpel. F, seed. G, under surface of leaf. G_1, peltate scale, surface view. G_2, peltate scale from below.

an epicalyx. Petals often elongated, sometimes absent. Stamens free or united into a tube ; anthers reniform to linear, 1-celled ; pollen smooth. Ovary superior, 2–5-celled ; style simple, capitate or lobed ; ovules 2 or more on the inner angle of each cell. Capsule loculicidally dehiscent or not dehiscent, the valves rarely falling away. Seeds often embedded in hairs from the wall of the fruit, with little or no endosperm and flat or contorted or plicate cotyledons.

Arboreal representatives of the *Malvaceae*, with which they have much in common ; confined to the tropics.

Stamens numerous ; flowers large and solitary :
Calyx deeply 5-lobed ; fruits indehiscent, not woolly inside .. .. 1. **Adansonia**
Calyx truncate or subtruncate ; fruits dehiscent, filled with soft woolly floss inside 2. **Bombax**
Stamens 15, united in 3's into bundles ; anthers sinuous ; calyx slightly 5-lobed ; fruits filled with soft woolly floss inside ; flowers small, in fascicles .. 3. **Ceiba**

1. ADANSONIA Linn.—F.T.A. 1 : 212.

A large tree (see frontispiece) ; leaves digitately 5-foliolate, long-petiolate ; leaflets obovate, acutely acuminate, subsessile, up to about 12 cm. long and 5 cm. broad, entire or denticulate, stellate-pubescent or nearly glabrous below ; flowers large, pendulous on long stalks ; calyx deeply 5-lobed, very hirsute-tomentose on both sides ; petals setose outside, adnate to the base of the staminal column ; stamens very numerous ; fruits oblong-ellipsoid to globose .. .. .. *digitata*

A. digitata *Linn.*—F.T.A. 1 : 212 ; Chev. Bot. 73. *A. sphaerocarpa* A. Chev. Stem comparatively short and stout, 40–60 ft. high, 30–40 or more feet in girth, with short thick branches ; bark unarmed, often purplish ; fruit 6–9 in. long, pendulous on long stalks, yellowish-felted outside ; seeds embedded in a dry acid pulp.
Tropical and subtropical Africa ; in the dry coastal regions and in savannah forest and open country, often near villages. Exsicc.—*Perrottet. T. Vogel* 34. *Baikie. Farmar* 515. *Chipp* 513. (See Appendix).

2. BOMBAX Linn.—F.T.A. 1 : 213.

Leaflets rounded at the apex, with a very short obtuse point or mucronate :
Leaflets broadly obovate, with up to 10 pairs of lateral nerves, 10 cm. long, 4 cm. broad, subsessile ; stamens not in bundles (according to Ulbrich) ; fruit short and obovoid .. .. 1. *brevicuspe*
Leaflets narrowly oblanceolate, mucronate, with 15–25 pairs of lateral nerves, 10–15 cm. long, 3·5–5 cm. broad, slightly stalked ; stamens in bundles, about ½ as long as the petals ; fruit long and cylindric .. .. 2. *flammeum*
Leaflets with a fairly long acumen, sessile or subsessile :
Stamens only slightly united into bundles at the base ; leaflets obovate, cuneate at the base, subsessile, with 9–12 prominent lateral nerves on both surfaces, coriaceous, 8–10 cm. long, 4–5 cm. broad ; calyx 1·5 cm. long ; fruit cylindric, with convex valves .. .. 3. *buonopozense*
Stamens united fairly high up into bundles :
Fruit cylindric, with convex valves ; leaflets sessile, narrowly oblanceolate, gradually long-acuminate with a long subulate tip, about 16 cm. long and 5 cm. broad, thin ; lateral nerves 10–15 pairs ; stamens about ⅔ as long as the petals .. 4. *Buesgenii*
Fruit angular with flat or concave valves ; leaflets distinctly stalked, shortly and abruptly acuminate, obovate-oblong, 12–15 cm. long, 5–7 cm. broad, subcoriaceous ; lateral nerves about 20 pairs .. .. 5. *angulicarpum*

1. **Bombax brevicuspe** *Sprague* in Kew Bull. 1909 : 306 ; Chev. Bot. 74. A tall tree of the evergreen forest but deciduous, 100 ft. or more high, with small buttresses ; capsule brown, glabrous or sparsely hairy, about 3 in. long, usually not bursting on the tree ; floss reddish-yellow ; seeds large, ½ in. long.
Ivory Coast : Anoumaba (Nov.). Gold Coast : Subirinsu (fr. Feb.) ! Imbraim (fr. Mar.) ! Dunkwa (fr. June) ! S. Nigeria : Johann-Albrechtshöhe (fr. Mar.) ! Also in French Cameroons. Exsicc.—*Thompson* 10 ; 12 ; 31. *Vigne* 887. *Schultze* 105. (See Appendix).
2. **B. flammeum** *Ulbrich* in Engl. Bot. Jahrb. 49 : 530 (1913). *Gossampinus flammea* Bakh., partly. A large tree up to 150 ft. high, with spiny branches ; flowers red, cylindric-campanulate, about 3 in. long, not expanding ; stamens grey-tomentose in the lower part ; fruit 4–7 in. long, narrowed at the ends, dark brown to black, usually bursting on the tree ; floss snow-white.
Sierra Leone (cultivated) ! Gold Coast : Tanosu (Jan., Feb.) ! Togo : Misahöhe (fl. and fr. Mar.) ; in forest (Dec.). Cameroons Mt. : Victoria (Jan.). Common in French Cameroons ; also in Spanish Guinea. Exsicc.—*Sc. Elliot* (no number). *Chipp* 99. *Brent* 4. (See Appendix).
3. **B. buonopozense** *P. Beauv.*—F.T.A. 1 : 213 ; Stapf 582 ; Holl. 1 : 86 ; Chev. Bot. 74. *Gossampinus buonopozensis* Bakh. A tree of the savannah or deciduous forest, 40–90 ft. high ; bark with stout conical spines ; flowers scarlet, occasionally yellow, 2 in. long, opening widely, appearing Dec.–Feb. before the leaf ; fruit 4–5 in. long, not narrowed at the ends, brown ; floss white ; seeds scarcely ¼ in. long.
The commonest and most conspicuous species outside the evergreen forest throughout the area and extending to Eastern Cameroons and French Congo. Exsicc.—*Barter* 731. *Elliott* 18. *McLeod* (no number). *Dawe* 57. *Kersting* 464. (See Appendix).
4. **B. Buesgenii** *Ulbrich*, l.c. 537. *Gossampinus flammea* Bakh., partly. A tree with the habit of *Ceiba pentandra* but with less buttressed stem ; flowers red, tubular-campanulate ; about 3 in. long, stamens shaggy at the base.
S. Nigeria : without locality (Dec.) ! Also in French Cameroons, rare. Exsicc.—*Foster* 371.

5. **B. angulicarpum** *Ulbrich*, l.c. 534. *Gossampinus angulicarpa* Bakh. A tree 60 ft.; bark scaly and with stout spines; flowers red, about 3 in. long; stamens finely pubescent only at the base; fruit 4–7 in. long, 2–3 in. broad, narrowed at the top, blackish; floss dirty white or yellowish or brown.
Togo: Atakpame (Jan.)! Also in French Cameroons, uncommon. Exsicc.—*v. Doering* 351. (See Appendix).

3. CEIBA Plum. ex Mill.—F.T.A. 1: 213, as *Eriodendron* DC.

Leaves digitately 8–15-foliolate, long-petiolate; leaflets sessile, lanceolate to oblanceolate, acutely acuminate, acute at the base, 10–20 cm. long, 3–4 cm. broad, entire or slightly toothed in the upper part, glabrous; flowers fasciculate, small; pedicels about 3 cm. long, articulated at the top; calyx about 1 cm. long, shortly 5-lobed, lobes broad, glabrous; petals united at the base, 2–2·5 cm. long, densely silky-villous outside; stamens 15, united into 5 separate slender bundles; anthers sinuous; fruits ellipsoid or elongate-fusiform, narrowed at both ends, 4–12 in. long, pale brownish .. .. *pentandra*

C. pentandra *Gaertn.* Fruct. 2: 244, t 133. *Eriodendron anfractuosum* DC.—F.T.A. 1: 214; Chev. Bot. 74; Holl. 1: 87. A large tree up to 150 ft. or more, in evergreen forest; trunk with large plank-buttresses extending 20 ft. or more up; branches in different forms without prickles or with obtuse or acutely pointed stout prickles, generally prickly in the young state; flowers white, appearing either when the whole tree is bare or on leafless branches; fruits in some forms bursting on the tree, in others after falling; floss white or grey.
In both forest and open country, commonly planted and probably of ancient introduction in Africa; distributed throughout the tropics. (See Appendix).

73. MALVACEAE

Herbs often with fibrous stems or rarely shrubs; hairs usually stellate or lepidote. Leaves alternate, often palmately nerved or divided; stipules present. Flowers actinomorphic, hermaphrodite or rarely unisexual. Sepals valvate, with or without an epicalyx of bracteoles. Petals 5, free from each other but often adnate at the base to the staminal column, contorted or imbricate. Stamens numerous, monadelphous; anthers 1-celled. Ovary syncarpous, rarely of 1 carpel, rarely the carpels in vertical rows; style one. Ovules on axile placentas. Fruit a capsule or breaking into separate compartments. Seeds usually with some endosperm and straight or curved embryo, the cotyledons often folded.

A large cosmopolitan family, generally recognised by the usually stellate indumentum, showy flowers with valvate calyx, monadelphous stamens and 1-celled anthers.

Epicalyx absent:
Carpels transversely divided, contracted in the middle, the upper half spreading stellately in fruit, 2-seeded, the lower seed tomentose; leaves entire, cordate; flowers small in panicles .. .. 1. **Wissadula**
Carpels not transversely divided:
Staminal column provided with anthers up to the top or nearly so:
Carpels 10 or more, with more than 1 ovule in each cell; leaves always cordate 2. **Abutilon**
Carpels up to 10, with 1 ovule in each cell; leaves usually not cordate .. 3. **Sida**
Staminal column destitute of anthers at the top; some of the leaves trifoliolate 9. **Hibiscus**

Epicalyx present:
Styles twice as many as the carpels; staminal column destitute of anthers at the apex:
Flowers not in heads or at any rate not surrounded by an involucre:
Bracts of epicalyx connate at the base and adnate to the calyx; carpels with hooked spines .. .. 4. **Urena**
Bracts of epicalyx free to the base or nearly so; carpels without hooked spines, but sometimes with barbate bristles .. .. 5. **Pavonia**
Flowers in heads surrounded by an involucre of bracts .. .. .. 6. **Malachra**
Styles the same number as the carpels or stylo more or less undivided:
Style undivided or nearly so:
Calyx truncate; seeds pubescent; tree with the leaves lepidote when young 7. **Thespesia**
Calyx 5-lobed; seeds cottony-hairy; dwarf shrublet with glandular leaves 8. **Cienfuegosia**
Style divided into separate stigmas:
Epicalyx of 5 or more free or partially connate usually narrow bracts; ovules 3 or more in each cell; carpels 5, dehiscent, not separating from the axis; seeds various .. .. 9. **Hibiscus**
Epicalyx of 3 broad foliaceous more or less cordate usually deeply toothed or laciniate bracts; calyx truncate or nearly so; carpels usually 5, with numerous ovules, dehiscent; seeds covered with long cottony hairs .. ..10. **Gossypium**

Epicalyx of 7–10 small or obsolete linear bracts ; ovary 5-celled with 1 ovule in each cell ; fruits depressed, prominently 5-angled ; carpels dehiscent 11. **Kosteletzkya**
Epicalyx of 1–3 narrow free bracts ; carpels 8–12, 1-ovulate, subindehiscent, separating from the central axis .. .. 12. **Malvastrum**

1. WISSADULA Medik.—F.T.A. 1 : 182.

An undershrub with slender branches, the latter puberulous with very short hairs and often also pubescent with stellate hairs ; leaves ovate, cordate, acutely acuminate, 5–10 cm. long, 4–8 cm. broad, entire, minutely puberulous above, densely stellate-tomentellous below ; flowers small in terminal panicles ; epicalyx none ; calyx 5-lobed to about the middle ; fruiting carpels 5, about 1 cm. long, abruptly spreading in the upper half, with rather long sharp beaks, minutely puberulous, constricted in the middle, the upper seed puberulous, the lower tomentose

amplissima var. *rostrata*

W. amplissima var. **rostrata** *R. E. Fries* in Kungl. Sv. Vet. Akad. Handl. 43, 4 : 51. *W. rostrata* Planch.—F.T.A. 1 : 182 ; Holl. 1 : 67 ; Chev. Bot. 59 (as *W. hernandioides* Garcke and *W. periplocifolia* Presl). Erect, 3–6 ft. ; leaves hoary below ; flowers yellow or orange to reddish.
Common in savannah woodlands from Cape Verde to the Red Sea, Abyssinia to Rhodesia, Congo, Angola ; also in Cape Verde Islands and St. Thomas. Exsicc.—*Perrottet* 7. *Heudelot* 222. *Farmar* 134. *T. Vogel* 81. *Barter* 304 ; 1043 ; 1717. *Millen* 74. *Chev.* 2744 ; 14813. *Schlechter* 13038. *Warnecke* 176. (See Appendix).

2. ABUTILON Gaertn.—F.T.A. 1 : 183.

Carpels numerous, 20 or more :
Carpels rounded at the apex :
Branches terete or subterete, softly tomentellous ; leaves ovate-rounded, cordate at the base, triangular-acute at the apex, 3–7 cm. in diam., doubly dentate, softly tomentellous on both sides ; flowers usually paired, shortly pedicellate ; calyx-lobes acuminate, tomentose .. .. 1. *muticum*
Branches angular, tomentellous, leaves broadly ovate, acuminate, widely cordate, 5–12 cm. long, up to 10 cm. broad, slightly crenulate, minutely tomentellous ; flowers in leafy panicles ; calyx-lobes acute, tomentellous .. .. 2. *angulatum*
Carpels acutely acuminate ; pedicels long, especially in fruit :
Leaves conspicuously acuminate, broadly ovate, 4–12 cm. long, slightly dentate ; carpels gradually acuminate, at length spreading stellately in fruit, at first densely pilose, at length nearly glabrous and blackish ; flowers solitary ; pedicels jointed near the top ; calyx-lobes acuminate .. .. 3. *mauritianum*
Leaves not acuminate, crenate, 3–7 cm. long, stellate-tomentellous below, less so above, carpels abruptly acute, remaining more or less erect and villous ; flowers solitary ; pedicels jointed near the top, elongating in fruit ; calyx-lobes acuminate 4. *asiaticum*

Carpels about 10 :
Stems densely pilose with long rather weak, more or less reflexed hairs ; calyx-lobes broadly ovate, as long as the carpels ; carpels 10, acute, villous, 3–5-seeded ; petioles becoming reflexed ; leaves broadly ovate, cordate, gradually acute, up to 10 cm. long and 8 cm. broad, crenate, slightly stellate-pubescent above, more densely so below ; flowers solitary or paired on each peduncle .. 5. *tortuosum*
Stems at most shortly stellate-tomentose, rarely with a few longer, very weak ascending hairs :
Leaves acuminate ; indumentum lax and soft :
Stipules ovate to broadly lanceolate, subcordate at the base, 1–2 cm. long, up to 1·3 cm. broad ; leaves ovate-rounded, denticulate, rather widely cordate, 5–12 cm. long, with long spreading hairs on the nerves below ; flowers in terminal panicles ; pedicels jointed about the middle ; carpels acute .. .. .. 6. *auritum*
Stipules filiform, 1 cm. long, ciliate ; leaves rounded-ovate, slightly trilobate, up to 12 cm. broad, pilose on the nerves, coarsely crenate ; flowers in axillary and terminal cymes ; pedicels jointed near the apex ; carpels with long subulate points .. .. 7. *ramosum*
Leaves not acuminate ; indumentum very short and tomentellous :
Leaves ovate, subentire or denticulate, cordate, 2–5–7 cm. long, 2–5 cm. broad ; stipules linear, early deciduous ; flowers solitary or paired ; pedicels jointed near the apex ; carpels densely tomentose, acute .. .. 8. *fruticosum*
Leaves subreniform, shortly 3–5-lobulate, cordate, about 2·5 cm. broad ; stipules linear, caducous ; flowers axillary and terminal, 1–3 together ; pedicels jointed near the apex ; carpels with subulate points .. .. .. 9. *macropodum*

1. **Abutilon muticum** *Webb.*—F.T.A. 1 : 185 (as *A. glaucum* Webb) ; Chev. Bot. 60.
An undershrub, 3–6 ft. high ; flowers yellow or pink with a darker centre ; carpels 2–3-seeded.
Mauritania : Adrar. French Sudan : Timbuktu district (July) ! Senegal : Dagana ! N. Nigeria : Kuka (Feb.) ! Cape Verde Islands and in the drier regions of tropical Africa and Asia. Exsicc.—*Heudelot* (no numbers). *E. Vogel* 34.

2. **A. angulatum** *Mast.*—F.T.A. 1 : 183. *A. intermedium* Hochst., Chev. Bot. 60. A tall perennial, 6–12 ft. high, whitish downy all over ; flowers yellow or lilac with dark purple centre ; carpels 1-seeded.
Senegal : Richard Tol (Feb.) ! Thiès. Gambia : Albreda. N. Nigeria : Katagum (Sept.) ! Throughout tropical Africa. Exsicc.—*Perrottet* 138. *Dalz.* 78.
3. **A. mauritianum** Sweet, Hort. Brit. ed. 1 : 53. *Sida mauritianum* G. Don. *A. zanzibaricum* Bojer ex Mast.—F.T.A. 1 : 186. *A. indicum* Mast. in F.T.A. 1 : 186, partly, not of Sweet ; Holl. 1 : 68 ; Chev. Bot. 60. A whitish-downy perennial, 3–5 ft. high ; flowers yellow or orange.
Fairly common throughout the area, extending to Gabon, Uganda and East Africa. Exsicc.—*Barter* 3347. *Irving*. *Millen* 127. *Johnson* 846. *Farmar* 392. (See Appendix).
4. **A. asiaticum** G. Don.—F.T.A. 1 : 184 ; Holl. 1 : 68. An erect, more or less villous perennial with wrinkled leaves and yellow-orange flowers.
Gold Coast : Accra (Mar., Sept.) ! Widely distributed in the tropics. Exsicc.—*T. Vogel* 7. *Dalz.* 125. *Deighton* 590.
5. **A. tortuosum** *Guill. & Perr.* Tent. Fl. Seneg. 1 : 68. *A. graveolens* W. & A.—F.T.A. 1 : 184 ; Chev. Bot. 60. A tall perennial, 3–6 ft., with more or less zigzag hairy branches ; flowers yellow to orange.
French Sudan : Macina. Senegal : Richard Tol ! St. Louis. Common in the Eastern Tropics ; perhaps introduced into Africa. Exsicc.—*Perrottet*.
6. **A. auritum** *Sweet*—F.T.A. 1 : 187. A tall perennial, covered with down and spreading hairs ; leaves on very long hispid stalks with conspicuous eared stipules ; seeds with scattered groups of short stellate hairs.
Sierra Leone : Wellington (Mar.) ! Freetown, Leicester (Dec.) ! Probably introduced from the Eastern Tropics.
7. **A. ramosum** *Guill. & Perr.*—F.T.A. 1 : 186. An erect branching perennial, somewhat glandular-tomentose and with spreading hairs ; leaves long-stalked ; flowers yellow or whitish ; carpels 2–3-seeded.
Senegal : Richard Tol (Dec.) ! Dagana (Sept.–Oct.) ! Katagum (Sept.) ! Exsicc.—*Perrottet* 137. *Heudelot* 303. *Dalz.* 71.
8. **A. fruticosum** *Guill. & Perr.*—F.T.A. 1 : 187 ; Chev. Bot. 59. A hoary, much-branched, woody perennial, 3–6 ft. high, with comparatively small leaves ; flowers yellow ; carpels 2–3-seeded.
Senegal : near St. Louis ! Extends to Abyssinia, Somaliland, Egypt, Arabia and N.W. India. Exsicc.—*Roger*.
9. **A. macropodum** *Guill. & Perr.* Tent. Fl. Seneg. 1 : 69, t. 14.—F.T.A. 1 : 185. Low, much-branched, suffrutescent, downy on the younger parts ; flowers yellow ; seeds large, 3 in each carpel.
Senegal : Richard Tol (Sept.–Oct.). Exsicc.—*Perrottet*.

3. SIDA Linn.—F.T.A. 1 : 178.

Prostrate, with long slender branches, often rooting at the lower nodes ; stems weakly pilose ; stipules linear-filiform ; leaves broadly ovate, widely cordate, acuminate, 2–5 cm. long, up to 4 cm. broad, doubly crenate, sparingly pubescent ; petiole nearly as long as the blade ; flowers solitary or paired ; pedicels filiform
1. *veronicifolia*

More or less erect herbs or small shrubs ; not rooting at the nodes :
Leaves linear or linear-lanceolate, entire ; flowers in lax terminal cymes ; leaf-blades up to 12 cm. long and 1·5 cm. broad, loosely pilose ; petiole short ; stipules linear ; pedicels jointed above the middle ; carpels 5 or 6, scarcely beaked .. 2. *linifolia*
Leaves lanceolate to broadly ovate or rounded ; flowers mostly axillary :
Leaves cordate at the base, broadly ovate ; flowers clustered or rarely subsolitary :
Indumentum of long pilose loose hairs ; leaves crenate-serrate, 3–7 cm. long, 2–4 cm. broad, pilose ; petiole fairly long ; stipules subulate ; flowers clustered or rarely solitary, shortly pedicellate ; carpels 5, scarcely beaked .. .. 3. *urens*
Indumentum of short dense stellate hairs ; leaves dentate, not acuminate, 3–7 cm. long, 3–5 cm. broad, softly tomentose ; petiole stout, nearly as long as the blade ; stipules filiform, short ; flowers solitary in the lower axils, more crowded above ; carpels 10, with long sharp awns covered with reflexed hairs .. 4. *cordifolia*
Leaves rounded to acute at the base ; flowers mostly solitary or paired :
Leaves covered with a close short stellate indumentum below :
Carpels 7–8, indehiscent, rugose, the beaks more or less connivent ; leaves ovate-elliptic, crenate, rounded at the apex, 2·5–4·5 cm. long, 1·5–3 cm. broad, very shortly tomentellous ; petiole about ½ as long as the blade ; stipules linear ; flowers solitary or paired .. .. 5. *grewioides*
Carpels 9–10, dehiscent, glabrous, the fairly long beaks connivent ; leaves rhomboid-ovate or lanceolate, doubly serrate, acute, 3–7 cm. long, 2–3·5 cm. broad, very softly tomentellous below, petiole short ; flowers solitary ; pedicels jointed towards the apex .. .. 6. *rhombifolia*
Carpels 5, dehiscent at the base, shortly awned ; leaves oblong to rounded, crenate, 1·5–3 cm. long, 0·5–2 cm. broad, softly tomentellous below ; petiole ½ as long as the leaf ; stipules linear ; flowers solitary to clustered ; pedicels jointed above the middle .. .. 7. *alba*
Leaves glabrescent or very thinly pilose or pubescent below ; stems with very short 6- or more-rayed hairs or glabrescent ; carpels 7–8, sharply 2-awned, rugose ; leaves lanceolate or lanceolate-rhomboid, serrate, glabrous or nearly so, 3–8 cm. long, up to 3 cm. broad ; petiole very short ; stipules linear-lanceolate, subfoliaceous ; flowers solitary ; pedicels usually short, if long then sometimes jointed
8. *carpinifolia*

1. **Sida veronicifolia** *Lamk.* Encycl. 1 : 5. *S. humilis* Cav.—F.T.A. 1 : 179 ; Chev. Bot. 59. A straggling wayside plant, sometimes matting the sandy soil, with pale yellow flowers.
Sierra Leone : Talla Hills (Feb.) ! Ivory Coast : Bingerville (Dec.) ; Bouroukrou (Dec.–Jan.). S. Nigeria : Lagos ! Distributed in the tropics generally. Exsicc.—*Barter* 2139. *Sc. Elliot* 4857. *Millen* 73.
2. **S. linifolia** *Cav.*—F.T.A. 1 : 179 ; Stapf 580 ; Chev. Bot. 58. A stiff, erect, more or less hairy weed, 1½–2 ft. ; flowers white, sometimes pink, ½–¾ in. across ; petals red-purple at the base. Throughout the area and to Angola and Tanganyika ; also in tropical America. Exsicc.—*Heudelot* 492. *T. Vogel* 16 ; 17 ; 19. *Barter* 851. *Sc.-Elliot* 4135. *Brown* 380. *Millen* 30. *Warnecke* 267. (See Appendix).

FIG. 111.—PAVONIA HIRSUTA *Guill. & Perr.* (MALVACEAE).

A, lobe of epicalyx. B, flower-bud. C, portion of flower. D, anther. E, pistil. F, ovary, calyx and epicalyx. G, cross section of fruit. H, mature fruit.

3. **S. urens** *Linn.*—F.T.A. 1 : 179 ; Holl. 1 : 67 ; Chev. Bot. 59. A hirsute perennial ; branches sometimes lax and trailing ; flowers whitish or pale yellow.
Senegal : Dakar (Jan.–Apr.) ; Cape Verde (Sept.–Oct.) ! Sierra Leone : various localities ! S. Nigeria : Aguku ! From Cape Verde Islands to Abyssinia and Arabia, Congo, Angola and Nyasa ; also in tropical and temperate S. America. Exsicc.—*Perrottet* 142 ; *Heudelot* 993. *Sc. Elliot* 3907. *Thomas* 737 ; 5150 ; 6222 ; 6498 ; 6901.
4. **S. cordifolia** *Linn.*—F.T.A. 1 : 181 ; Stapf 580 ; Chev. Bot. 57. An erect, softly downy perennial, up to 5 ft. high, with bright yellow flowers ; common in waste and sandy places throughout the tropics and subtropics. (See Appendix).
5. **S. grewioides** *Guill. & Perr.*—F.T.A. 1 : 182 ; Chev. Bot. 57. A rather hoary woody herb, 2 ft. or more high ; flowers yellow.
French Sudan : Timbuktu district (Aug.) ! Macina. Senegal : ? locality ! Ivory Coast : Cavally R., Bliéron ; Tabou ; Bériby (Aug.) ! Gold Coast : Accra (Mar.) ! N. Nigeria : Katagum (Oct.) ! Extends to East Africa and Abyssinia, Socotra and Arabia. Exsicc.—*Roger* 8. *Heudelot* 413. *Dalz.* 69. *Deighton* 565.
6. **S. rhombifolia** *Linn.*—F.T.A. 1 : 181 ; Stapf 580 ; Holl. 1 : 66 ; Chev. Bot. 58. A perennial wayside weed, 1–several feet high, very variable ; flowers pale yellow deepening to orange ; common in the tropics. (See Appendix).
7. **S. alba** *Linn.* Sp. Pl. ed. 2 : 960. *S. spinosa* Linn.—F.T.A. 1 : 180 ; Chev. Bot. 58. A woody herb with branches sometimes lax and trailing ; leaf stalks sometimes with a small spine at the base ; flowers small, yellow.
French Sudan : Sompi (Aug.) ; Mopti to Djenné (Sept.). Senegal : ? locality ! Togo : Lome ! N. Nigeria : Sokoto (Dec.) ! Bauchi Plateau, Lemme, 2,600 ft. (May) ! S. Nigeria : Lagos ! Common in the tropics and subtropics. Exsicc.—*Roger* (no number). *Lely* 140 ; 150. *Moiser* 251. *Dawodu* 325. *Warnecke* 150.
8. **S. carpinifolia** *Linn. f.*—F.T.A. 1 : 180 ; Stapf 580 ; Holl. 1 : 66. Perennial erect, sometimes shrubby up to 8 or 10 ft. high ; flowers pale yellow.
Throughout the area from Cape Verde Islands to Fernando Po ; a common weed in streets and waste places. Extends to East Africa and Rhodesia, Congo and S.W. Africa ; also in India, West Indies and tropical America. (See Appendix).

4. URENA Linn.—F.T.A. 1 : 189.

A fibrous undershrub covered with stellate hairs ; leaves very variable, usually more or less 3–5-lobed, sometimes deeply so, whitish below ; middle nerve often with a large pitted gland near the base ; flowers axillary, usually solitary ; epicalyx of 5 linear-lanceolate bracts united at the base and persistent in fruit ; fruit depressed-globose, covered with rigid hooked bristles .. .. *lobata*

U. lobata *Linn.*—F.T.A. 1 : 189 ; Stapf 580 ; Holl. 1 : 68 ; Chev. Bot. 61. Varying from a low woody weed to a shrub 8–10 ft. high ; flowers rose-pink, 1 in. or less long ; cultivated in some of its forms.
A widely distributed plant of the tropics and subtropics. (See Appendix).

5. PAVONIA Cav.—F.T.A. 1 : 189 ; see also Ulbrich in Engl. Bot. Jahrb. 57 : 54 (1920).

Leaves digitately divided almost to the base ; lobes 3–5, oblanceolate, slightly toothed, up to 2·5 cm. long, densely tomentose below with long and short stellate hairs ; petiole usually longer than the blade ; stipules linear-filiform ; flowers solitary, on long pedicels ; epicalyx persistent, of 10 linear-filiform pilose bracts ; fruits sub-globose, slightly winged, unawned .. .. 1. *zeylanica*

Leaves at most only shortly divided :

Leaves cordate at the base, fairly large :

Leaves slightly lobed, densely tomentose below, lobes triangular, doubly dentate ; flowers solitary or crowded above ; calyx persistent ; carpels not awned, with reflexed hairs on the margins .. .. 2. *hirsuta*

Leaves distinctly digitately lobed, slightly pubescent below, usually coarsely toothed ; petiole mostly longer than the blade ; flowers clustered in the leaf-axils on short pedicels ; calyx persistent ; carpels awned with short reflexed bristles 3. *Schimperiana*

Leaves as above but villous-pilose below .. 3. *Schimperiana* var. *hirsuta*

Leaves rounded at the base, elliptic-suborbicular, not lobed, 1–2 cm. long, laxly tomentose below with long and short stellate hairs ; flowers axillary, solitary, on slender pedicels jointed towards the top ; epicalyx persistent, forming a little basket containing the membranous winged, unawned, softly pubescent carpels 4. *Kotschyi*

1. **Pavonia zeylanica** *Cav.*—F.T.A. 1 : 192 ; Ulbr. l.c. 153. *P. arabica* A. Chev. Bot. 62, not of Hochst. Perennial with hispid branches 1–1½ ft. high from a thick woody stock ; flowers yellow or reddish, exceeding the epicalyx.
French Sudan : Tacadzi (Aug.) ! Senegal : Walo and Cayor ! Richard Tol ; common in sandy plasni of the lower Senegal basin. Extends to Abyssinia and Somaliland, S.E. Arabia and India. Exsicc.—*Perrottet. Heudelot* 404.
2. **P. hirsuta** *Guill. & Perr.*—F.T.A. 1 : 191 ; Chev. Bot. 62 ; Ulbr. l.c. 116. An erect or sometimes prostrate undershrub softly yellowish tomentose all over ; flowers large yellow with a red-purple centre 2 in. or more across ; epicalyx of 12 downy free bracts, calyx with 3–5 green veins.
French Sudan : Timbuktu (Sept.) ! Senegal : Richard Tol. etc. ! Tivaouane (Dec.). French Guinea : Futa Jallon (Sept.). N. Nigeria : Sokoto (June, Nov.) ! Katagum (Nov.) ! Lake Chad (Feb., Dec.) ! Extends across to Upper Nile ; also in S. Angola to S.W. Africa and Bechuanaland. Exsicc.—*Heudelot* 410. *E. Vogel* 42. *Elliotti* 148. *Dalz.* 72 ; 420. (See Appendix).
3. **P. Schimperiana** *Hochst.*—F.T.A. 1 : 192 ; Chev. Bot. 62 ; Ulbr. l.c. 107. An undershrub, 4–12 ft. high ; stems variously smooth or tomentose ; lower leaves 5–9-lobed ; flowers white, rarely reddish, about 2 in. across ; epicalyx of 10–12 linear free bracts.
French Guinea : Longuery (Dec.) ! Bowali (Dec.) ! Farana (Feb.) ; Futa Jallon (Jan., Sept.). Togo : Bismarckburg (Oct., fl. and fr. Nov.). Cameroons Mt. : Buea, etc. (fl. and fr. Jan., Mar., Nov.) ! Fernando Po (Nov.). Also in French Cameroons, Belgian Congo, Uganda, and common from Eritrea and Abyssinia throughout East Africa and the Mascarene Islands. Exsicc.—*Dunlap* 126. *Chev.* 20683. (See Appendix).
Var. **hirsuta** *Hochst.* ex *Ulbr.* in Engl. Bot. Jahrb. 57 : 109.

French Guinea : Mamou to Diaguissa ! Cameroons Mt. : near Buea ! Extends to Abyssinia and East Africa. Exsicc.—*Chev.* 18588 ; 20350. *Dunlap* 102.

4. **P. Kotschyi** *Hochst.*—F.T.A. 1 : 192 ; Chev. Bot. 62 ; Ulbr. l.c. 171. A low woody perennial of semi-desert regions, with short densely pubescent branchlets ; flowers yellow, less than 1 in. across, shorter than the epicalyx of 10 linear free bracts.

French Sudan : Timbuktu (July) ! N. Nigeria : Kuka (fr. Jan.) ! Across the Northern Sudan to Nubia, Abyssinia and Somaliland ; also in Arabia. Exsicc.—*E Vogel* 27. *Chev.* 1246.

6. MALACHRA Linn.—F.T.A. 1 : 188.

Leaves deeply 3-7-lobed, lobes oblanceolate, toothed, coarsely strigose below like the stems, about 6 cm. long ; flowers in dense subglobose heads subtended by leafy suborbicular bracts ; epicalyx of several linear-filiform plumose bracts ; calyx long-pilose ; fruiting carpels reticulate, about ½ as long as the calyx .. 1. *radiata*

Leaves slightly 3-7-lobed, lobes broad at the base, slightly pubescent below and on the stems, 5-9 cm. long ; flowers few in heads ; bracts ovate, cordate, pale with distinct veins ; calyx markedly veined, pilose ; carpels shorter than the calyx, finely reticulate, glabrous .. .. 2. *capitata*

1. **M. radiata** *Linn.*—F.T.A. 1 : 188 ; Chev. Bot. 61. An erect, coarsely hairy perennial, about 4 ft. high ; in wet places ; flowers light red.

Ivory Coast : between Toumodi and Nzaakro (Aug.). N. Nigeria : Nupe ! Extends to Upper Nile district. Also in tropical America. Exsicc.—*Barter* 1547.

2. **M. capitata** *Linn.*—F.T.A. 1 : 188. Like the last, with roundish leaves and yellow or white flowers.

Senegal : Richard Tol. Senegal to Congo. A West Indian plant.

FIG. 112.—CIENFUEGOSIA HETEROCLADA. *Sprague* (MALVACEAE).

A, flower-bud. B, longitudinal section of flower. C, stamen. D, cross section of ovary. E, dehiscence of fruit. F, seed. G, level of soil.

7. THESPESIA Corr.—F.T.A. 1 : 209.

A coastal tree or shrub ; leaves ovate, acuminate, cordate, 6–15 cm. long, 5-10 cm. broad, entire, papery, scaly when young, at length nearly glabrous ; petiole as long as the blade ; flowers axillary, solitary ; pedicels stout, up to 4 cm. long ; calyx cupular, about 1 cm. long, truncate or minutely toothed, scaly outside ; petals yellow, large and showy, densely scaly outside ; fruit depressed, woody, finely scaly, about 2·5 cm. diam. .. .. *populnea*

T. populnea *Corr.*—F.T.A. 1 : 209.

Generally planted in the streets of the coast towns. Widely distributed in the tropics.

8. CIENFUEGOSIA Cav.—F.T.A. 1 : 208, as *Fugosia* Juss.

Leaves undivided or slightly lobulate, obovate, very shortly acuminate, 8–13 cm. long, 4–6·5 cm. broad, 5-nerved at the base, glabrous but gland-dotted below, finely reticulate on both surfaces ; petiole very short ; stipules linear-subulate, about 5 mm. long ; flowers from near the base of the previous season's stem ; pedicels up to 3 cm. long ; epicalyx of about 3 short unequal bracts ; calyx turbinate, 1·5 cm. long, 5-lobed, lobes acuminate, nerved and gland-dotted .. 1. *heteroclada*

Leaves digitately divided to the base, lobes 5–7, linear or oblanceolate, up to 4 cm. long, glabrous; petiole about ¼ as long as the leaf; stipules linear, slightly pubescent; flowers on the young shoots, axillary, solitary; pedicels longer than the leaves; epicalyx of 10–12 short linear bracts; calyx 1·5 cm. long, lobes lanceolate, acuminate, 3-nerved and gland-dotted .. .. 2. *digitata*

1. **C. heteroclada** *Sprague* in Kew Bull. 1907 : 48. An undershrub sending up branches from a woody stock after burning; stems angular, glabrous, dark gland dotted; flowers pink or purplish, 1 in. or more long; capsule obovoid, ¾ in. long, gland-punctate; seeds densely clothed with long rusty hairs.
N. Nigeria: Kontagora (Dec.)! Naraguta (Mar.)! Exsicc.—*Dalz.* 122. *Hill* 25. (See Appendix).
2. **C. digitata** *Cav.* Diss. 3 : 174, t. 72, fig. 2. *Fugosia digitata* Pers.—F.T.A. 1 : 209; Chev. Bot. 69. A low shrubby plant a foot or more high, with angular branches; flowers yellow with red-purple centre, 1–2 in. in diam.
French Sudan: Upper Volta, Koupela; Fada N'Gourma (July)! Télé (Aug.); Sompi (Aug.). Senegal: Richard Tol, etc.! Also in Mauritania and S.W. Africa to the Transvaal. Exsicc.—*Heudel.* *Roger.* *Sieber* 38.

9. HIBISCUS Linn.—F.T.A. 1 : 194.

Trees with broadly ovate, obovate or pentagonal, rather large, more or less cordate petiolate leaves :
Leaves broadly ovate-rounded, deeply cordate, acuminate, up to 15 cm. long and broad, entire or crenulate, at length glabrous, canous-tomentellous below, digitately nerved from the base; flowers solitary, large and showy .. .. 1. *tiliaceus*
Leaves pentagonal, with triangular denticulate lobes, rather widely cordate, up to 15 cm. broad, minutely stellate-puberulous below, 5–7-nerved at the base; flowers comparatively small in cymes .. .. 2. *sterculiifolius*
Leaves obovate, acutely acuminate, rounded-subcordate at the base, 9–15 cm. long, 5–8 cm. broad, pilose on the midrib, 3-nerved at the base; flowers solitary, 6·5 cm. long; calyx shortly 5-lobed; stipules setaceous .. .. 27. *grewioides*
Small shrubs, straggly climbers or herbs :
*Calyx more or less deeply lobed, persistent in fruit, not splitting down one side :
Epicalyx none; annual herb; leaves very variable, simple to trifoliolate on the same plant, ovate to linear-lanceolate, up to 8 cm. long, slightly pubescent, long-petiolate; flowers solitary, axillary; calyx longer than the fruit, lobes lanceolate, with green nerves; capsule pilose, about 8 mm. long; seeds strongly tuberculate 3. *ternatus*
Epicalyx present :
Bracts of the epicalyx forked or provided with a foliaceous appendage :
Stipules foliaceous, reniform-orbicular, 1–1·5 cm. long; stems prickly; leaves digitately 3–5-lobed, lobes coarsely toothed, up to 7 cm. long, prickly on the nerves below and on the petioles; flowers solitary; bracts of the epicalyx nearly as long as the calyx, linear with a foliaceous appendage on the back 4. *surattensis*
Stipules not foliaceous; usually not straggling :
Bracts of epicalyx 5–6, entire, spathulate-oblanceolate, much longer than the calyx; leaves 3–7-lobed, suborbicular, up to 18 cm. broad, crenate, softly pubescent below; flowers umbellate; pedicels up to 2·5 cm. long 5. *comoensis*
Bracts of epicalyx 10–12, forked :
Branches laxly prickly but not or scarcely hispid; bracts of the epicalyx nearly as long as the calyx; leaves at most 3-lobed or entire .. .. 6. *furcatus*
Branches densely prickly and also densely hispid; bracts of the epicalyx much shorter than the calyx; leaves usually more or less 5-lobed 7. *rostellatus*
Bracts of the epicalyx neither forked nor foliaceous :
†Epicalyx of more than 5 bracts :
Bracts of the epicalyx spathulate, somewhat widened above the middle, nearly as long as the calyx; leaves ovate to orbicular, often somewhat pentagonal, 5–8 cm. long and broad, doubly crenate, densely and softly tomentose below; flowers usually solitary, shortly stalked; fruit a little longer than the calyx, very villous .. .. 8. *panduriformis*
Bracts of the epicalyx narrowed to the apex :
Bracts of the epicalyx subulate or filiform, more or less terete :
Leaves broad, 5-lobed or pentagonal, with long petioles; flowers on slender pedicels :
Capsule depressed, distinctly winged, setose on the wings; leaves long-petiolate, 3- or slightly 5-lobed, coarsely dentate, softly pubescent, without incrustations; bracts of the epicalyx shorter than the calyx, pilose 9. *vitifolius*
Capsule pointed, not winged, densely villous; leaves long-petiolate, usually rather sharply 5-lobed, dentate, softly pubescent, with chalk-like incrustations at the base of the nerves below; bracts of the epicalyx very slender, shorter than the calyx :
Epicalyx about ¼ as long as the calyx :
Leaves more or less 5-lobed; indumentum of rather long and short hairs 10. *physaloides*

Leaves obscurely 3-lobed or not lobed ; indumentum short and harsh
11. *pseudohirtus*
Epicalyx about ¼ as long as the calyx .. .. .. 12. *longisepalus*
Leaves linear, subsessile, 5–8 cm. long, serrate, stellate-pubescent ; stipules filiform, 6 mm. long ; bracts of the epicalyx 10, about ½ as long as the calyx .. .. 13. *rhodanthus*
Leaves lanceolate to ovate, distinctly but rather shortly petiolate, serrate-dentate, 3–5 cm. long, 1–3·5 cm. broad, scabrid ; flowers solitary on slender pedicels ; bracts of the epicalyx very small and inconspicuous
14. *micranthus*
Bracts of the epicalyx linear to lanceolate, more or less flat :
Leaves not lobed, linear or lanceolate, subsessile or shortly petiolate, obtusely serrate :
Leaves linear, 5–13 cm. long, softly pubescent below ; seeds covered with small scales ; bracts of epicalyx about 10, linear, shorter than the calyx ; calyx-lobes lanceolate, setose ; capsule about 1·5 cm. long, setose-pilose
15. *squamosus*
Leaves narrowly lanceolate, 5–6 cm. long, thinly stellate-pubescent below ; bracts of epicalyx about 7, lanceolate, ⅓ as long as the calyx ; calyx-lobes triangular, 6 mm. long, thinly stellate-pubescent ; capsule scarcely 1 cm. long .. .. 16. *Gourmania*
Leaves lobed or broadly ovate, always with a fairly long petiole :
Stems very hispid with yellowish spreading hairs ; leaves deeply 3-lobed, or scarcely lobed, 5–7 cm. long, lobes oblong-lanceolate, crenate, slightly setulose on the nerves below ; bracts of epicalyx 8–10, rather short, pilose ; capsule 1·5 cm. long, sparingly setose ; seeds nearly smooth .. 17. *articulatus*
Stems not hispid, sometimes prickly :
Stems and calyx prickly ; calyx very setose but not woolly ; epicalyx ⅓ as long as the calyx ; leaves varying from simple to deeply 5-lobed ; flowers very shortly stalked ; calyx-lobes with a gland in the middle
18. *asper*
Stems not prickly or only slightly so :
Calyx woolly as well as setose ; leaves long-stalked, rarely lobed, broadly ovate, rather sharply serrate, glabrescent ; flowers very shortly stalked ; calyx-lobes with a large gland in the middle .. .. 19. *cannabinus*
Calyx not woolly, at most puberulous with minute stellate hairs :
Leaves digitately 5-divided, small ; fruit about 6 mm. long 20. *Scottellii*
Leaves not digitately divided or only divided into 3 ; fruits larger :
Epicalyx much shorter than the calyx in fruit ; flowers very shortly stalked ; leaves ovate, glabrous or nearly so .. 21. *Sabdariffa*
Epicalyx nearly as long as calyx in fruit ; leaves ovate-triangular, irregularly dentate, slightly setulose ; flowers very shortly stalked
22. *Whytei*

†Epicalyx of 5 bracts :
Leaves linear-lanceolate, often hastate at the base, up to 18 cm. long and 4 cm. broad, serrulate, slightly pubescent below ; flowers crowded at the apex of the shoots, very shortly stalked ; bracts of epicalyx linear, about as long as the calyx, ciliate .. .. 23. *congestiflorus*
Leaves broadly ovate to more or less pentagonal, rounded at the base :
Leaves permanently and softly stellate-tomentose below, dentate ; pedicels 1–2·5 cm. long ; bracts of the epicalyx longer than the calyx, lanceolate, acutely acuminate, about 2·5 cm. long, softly pubescent ; fruits 2·5 cm. long, acute pubescent .. .. 24. *owariensis*
Leaves permanently stellate-pilose below, rather coarsely doubly dentate ; flowers scattered ; bracts of the epicalyx shorter than the calyx, linear-subulate, bristly pilose ; calyx-lobes lanceolate, contracted towards the base, about 2 cm. long, trinerved .. .. 25. *lonchosepalus*
Leaves soon glabrescent or pilose only on the nerves ; pedicels usually rather shorter than above :
Flowers shortly stalked, axillary and crowded at the apex of the stem ; bracts of the epicalyx longer than the calyx, linear-lanceolate, acute, about 2 cm. long, slightly pubescent ; fruits broadly ovoid, 2 cm. long, subacute, at first stellate-setose .. .. 26. *lunariifolius*
Flowers solitary, shortly pedicellate ; bracts of the epicalyx short, united into a 5-dentate cup about 2·5 mm. long ; corolla 4·5 cm. long ; stipules filiform
27. *grewioides*

*Calyx at most toothed, eventually splitting down one side, falling away in fruit :
Perennial ; stems covered with reflexed bristly hairs ; fruits not conspicuously ribbed, more or less membranous, about 7 cm. long ; flowers very large, bracts of epicalyx ½ as long as calyx .. .. 28. *Abelmoschus*

Annual; stems glabrous or nearly so, or if hairy, then hairs not reflexed; fruits conical, ribbed, becoming fibrous; bracts of epicalyx variable, linear to broadly lanceolate .. .. 29. *esculentus*

Annual; stems softly pubescent, at length glabrous; fruits not ribbed, becoming dry and crustaceous, 3–4 cm. long; flowers small, about 3 cm. long; epicalyx absent .. .. 30. *ficulneus*

1. **Hibiscus tiliaceus** *Linn.*—F.T A. 1 : 207; Holl. 1 : 75; Chev. Bot. 69. Epicalyx not enclosing the calyx in bud, with very short lobes much shorter than the tube. A small tree with purplish branches; stipules leafy leaving annular scars; flowers 2–3 in. long, yellow with a purple centre.
Common in mud flats near the sea, in the tropics of both hemispheres. Exsicc.—*Sieber* 34. *T Vogel* 9; 58 *Barter* 1549; 1844. (See Appendix).
2. **H. sterculiifolius** *Steud*, Nom. ed. 2, 1 : 760. *H. quinquelobus* Don.—F.T.A. 1 : 208; Guill. & Perr. Tent. Fl. Seneg. 60, t. 13 (*Paritium sterculiaefolium* Guill. & Perr.); Chev. Bot. 67. *H. Perrottetii* Steud.; Chev. Bot. 66. A small tree; branches stellate-tomentose; flowers 1 in. or more long, much smaller than in the preceding, yellow with a brown-purple centre; epicalyx cup-shaped with 10 teeth ½ as long as the calyx.
French Sudan: Balani (Jan.)! Sarakouroba (Feb.)! Mussaia. Senegal: ? locality! Casamance (Jan., Feb.). Gambia: Albreda, etc.! French Guinea. Conakry (Feb.)· Isles de Los (Feb.); Kouria (Nov.). Sierra Leone: many localities! Scarcies R. (Feb.)! Samu, Luseniya (Dec.)! S. Nigeria: Benin (Jan.)! Exsicc.—*Heudelot* 640. *Sc. Elliot* 3995; 4057; 4156; 4567. *Farmar* 150. *Dudgeon* 4. *Brown-Lester* 19. *Dennett* 42. *Chev.* 146. (See Appendix).
3. **H. ternatus** *Mast.*—F.T.A. 1 : 206; Chev. Bot. 68. An erect, branching, pubescent herb, woody below; flowers pale yellow, less than 1 in. long.
French Sudan; Sompi; Mossi. Senegal: Richard Toi (Oct.)! N. Nigeria: Sokoto (June)! Jebba! Yola (June)! Extends to Nubia and Somaliland, East Africa, Rhodesia. S.W. Africa and Madagascar. Exsicc.—*Perrottet* 109. *Heudelot* 466. *Barter* (no number). *Dalz.* 81; 421.
4. **H. surattensis** *Linn.*—F.T.A. 1 : 201; Stapf 581; Holl. 1 : 75; Chev. Bot. 68. Herbaceous, trailing or climbing; stems with spreading hairs and recurved prickles; flowers yellow with red centre.
Throughout the area; also in French Cameroons and Island of St. Thomas, Congo, Angola, East Africa and in the Mascarene Islands. Exsicc.—*Sc. Elliot* 4323. *Whyte. Dawodu* 21; 304. *Foster* 138. *Dalz.* 1192. *Warnecke* 243. *Linder* 1434. (See Appendix).
5. **H. comoensis** *A. Chev.* Bot. 65, name only.
Ivory Coast: Middle Comoe; between Akabossué and Ebrinahoué (Dec.)! Exsicc.—*Chev.* 22613.
6. **H. furcatus** *Roxb.*—F.T.A. 1 : 201. *H. furcellatoides* Hochr. Erect or half climbing; leaves ovate or angular, long-stalked, 2–4 in. long; flowers solitary, yellow with red centre, about 2 in. long.
French Guinea! Sierra Leone: Kambia (Dec.)! Mano! Gold Coast: Prahsu! S. Nigeria: Brass! An Indian plant, found also in South Africa. Exsicc.—*Chev.* 12504. *Barter* 1845. *Sc. Elliot* 4349. *Cummins* 7. *Smythe* 60.
7. **H. rostellatus** *Guill. & Perr.*—F.T A. 1 : 201: Stapf 581; Holl. 1 : 73; Chev. Bot. 67. Undershrub, 6–10 ft., erect or half-climbing, hispid and with recurved prickles; epicalyx bracts with a spoon-shaped appendage or 3-partite; flowers large, yellow with a dark purple centre.
Gambia! Sierra Leone: Port Lokko (Dec.)! Yungeru (Jan.)! Yonibana (Oct.–Nov.)! Bumbuna (Oct.)! Batkanu (fr. Apr.)! Liberia: Kakatown! Sino Basin! Peahtah (Oct.)! Dahomey: Zagnanado, common (Feb.). N. Nigeria: Zaria (Feb.)! Vom! S: Nigeria: Ebute Metta! Lagos, Ikoyi (Mar., Nov.)! Ibadan (Feb.)! Extends to Nile Land, Congo, Angora, Uganda and East Africa. Exsicc. —*Brown Lester* 25. *Ingram. Dudgeon* 5. *Whyte. Milne* 42. *Dalz.* 360; 1059; 1195. *Dent Young* 18. *Thomas* 66; 3766; 6629. *Linder* 1098. (See Appendix).
8. **H. panduriformis** *Burm.*—F.T.A. 1 : 203; Chev. Bot. 66. Erect branched undershrub, 4–8 ft., covered with fine down mixed with bristles; flowers large, yellow turning orange, or purple-streaked, with a red or purple centre; seeds striped.
Senegal: Lower Senegal R. (Oct.)! N. Nigeria: Kontagora (Nov.)! Koriga River (Feb.)! Malgana (Dec.)! Nabardo (Sept.)! Lake Chad! Throughout tropical Africa and other tropics. Exsicc.—*Perrottet* 12. *Dalz.* 131; 410. *Lamb* 68. *Lely* 615.
9. **H. vitifolius** *Linn.*—F.T.A. 1 : 197; Holl, 1 : 76; Chev. Bot. 69. A tall, downy undershrub, sometimes with almost pungent hairs 3–6 ft. high; flowers bright yellow with a purple centre, about 2 in. long; recognisable by the 5-winged fruit.
Gold Coast: Cape Coast (July)! Aburi (Nov.)! Togo: Lome! Dahomey: Zagnanado. N. Nigeria: Jebba! Katagum (Sept.)! S. Nigeria: Abeokuta! Ibadan (Aug.)! Widespread in the tropics. Exsicc.—*T. Vogel* 66. *Barter* (no number). *Irving* 64. *Millen* 95. *Johnson* 847. *Warnecke* 204; 387. (See Appendix).
10. **H. physaloides** *Guill. & Perr.*—F.T.A. 1 : 199; Stapf 581; Holl. 1 : 73; Chev Bot. 67. A hispid undershrub, 3–6 ft. high, with foliage more or less like the preceding; flowers 1½ in. long, yellow with a red base, turning violet.
French Sudan: between Kita and Kati! Sierra Leone: ? ocality! Liberia: Kakatown! Banga (Oct.)! Ivory Coast: sea coast between Tabou and Beriby; Ano. N. Nigeria: Jebba (Sept.)! S. Nigeria: Ebute Metta! Lagos Colony! Throughout tropical Africa and in Canary, Cape Verde and Comoro Islands and Seychelles. Exsicc.—*Whyte. Millen* 124. *Elliott* 211. *Thomas* 8548; 8689; 8805. *Linder* 1169.
11. **H. pseudohirtus** *Hochr.* in Ann. Cons. Jard Bot. Genève 20 : 155; Chev. Bot. 67. An undershrub with shortly pilose and scabrid branchlets; flowers white, rather small, solitary, on long peduncles.
French Sudan: Macina (Sept.)! Exsicc.—Chev. 24866.
12. **H. longisepalus** *Hochr.* l.c. 167; Chev. Bot. 66. An undershrub, tomentose and with spreading hairs; flowers yellow, 1–1½ in. long; epicalyx very small, setaceous.
French Sudan; Macina (Sept.)! Exsicc.—*Chev.* 24842.
13. **H. rhodanthus** *Guerke* ex Schinz in Bull. Herb. Boiss. 3 : 405. An erect undershrub, 2–4 ft. high, stellate-pubescent; flowers solitary in the upper axils on stalks pointed near the top, yellow, reddish at the base, about ¾ in. long.
French Guinea: ? locality! Also in Congo, Angola and East Africa. Exsicc.—*Pobéguin* (no number).
14. **H. micranthus** *Linn.*—F.T.A. 1 : 205. Undershrub, 5–6 ft. high, with stiff, straight, scabrid branches; stipules almost spiny; flowers small, about ½ in. long, white turning pink; seeds cottony.
Senegal: Lower Senegal R.! Gold Coast: Accra! Togo: Lome! Extends in bush and open savannah to E. and S. Africa; also in Madagascar, Arabia and India. Exsicc.—*Heudelot* 539. *Warnecke* 218; 339. (See Appendix).
15. **H. squamosus** *Hochr.* in Ann. Cons. Jard. Bot. Genève 4 : 165 (1900). *H. lepidospermus* Mast.—F.T.A. 1 : 197, not of Miq. Stem erect, little-branched, 3 ft. or more, scabrid-pubescent or downy; flowers conspicuous, pale yellow with dark purple centre : common in marshy places.
Gold Coast: Accra, etc.! N. Nigeria: Nupe! Kontagora (Nov.)! Exsicc.—*Barter* 1165. *Dalz.* 127.
16. **H. Gourmania** *Hutch. & J. M. Dalz.* in Kew Bull. 1928 : ined. *Gourmania grewioides* A. Chev. Bot. 86, name only. A low woody shrublet a few inches high.
French Sudan: Gourma (July)! Mossi (Aug.)! Exsicc.—*Chev.* 24514; 24717.

17. **H. articulatus** *Hochst.*—F.T.A. 1 : 200 ; Chev. Bot. 63. Undershrub, 5–6 ft. high, or branches 1–1½ ft. from a perennial rootstock ; leaves grey below : flowers solitary, axillary, cream or yellow turning reddish, 1–1½ in. long.
French Sudan : Gourma. Ivory Coast : Toura country. Togo. N. Nigeria : Ilorin (Dec.) ! Nabardo, 2,300 ft. (May) ! Extends to Nile Land, Abyssinia, Uganda, East Africa and N. Rhodesia. Exsicc.—*Thornton. Lely* 206.

18. **H. asper** *Hook. f.*—F.T.A. 1 : 204 (under *H. cannabinus* L.). *H. cannabinus* var. *Chevalieri* Hochr. Erect undershrub, 6–8 ft. high, often red-tinged in parts and armed with small spine-tipped tubercles ; epicalyx 5–7 ; flowers fairly large, yellow with purple centre.
Gambia (July) ! French Guinea : Kouria (Oct.) ! Sierra Leone : Freetown ! Scarcies R., Kora ! Mahela, Samu ! Gold Coast : Ashanti, Dukwesein ! Dahomey ! N. Nigeria : Nupe ! Zungeru (Oct.) ! Sokoto (Oct.) ! Katagum (Sept.) ! Panshanu (Sept.) ! S. Nigeria : Lagos Colony ! Also in Eastern Sudan to Rhodesia. Exsicc.—*Turner. Barter* 1026. *Sc. Elliot* 4041 ; 4592. *Burton* (no number). *Dalz.* 65 (partly) ; 128 ; 426–7 (partly). *Lely* 145 ; 609. *Foster* 362. *Chipp* 599. *Brooks* 14. *Caille* ex *Herb. Chev.* 14909. (See Appendix).

19. **H. cannabinus** *Linn.*—F.T.A. 1 : 204 ; Holl. 1 : 70 ; Chev. Bot. 64–65 in cl. vars. An erect annual, 10–12 ft. ; flowers large, yellow with a red-purple centre.
Cultivated in most tropical countries as a fibre-plant, and naturalised. Exsicc.—*Johnson* 827. *Imp. Inst.* 37430 ex *Herb. A. E. Brown. Dalz.* 63 ; 64 ; 66 ; 67 ; 65 (partly) ; 424–5 ; 426 (partly). *Yates* 36. (See Appendix).

20. **H. Scotellii** *Bak. f.* in Journ. Linn. Soc. Bot. 30 : 74 (1894). Stem woody, branchlets stellate-pubescent ; leaves about 1 in. long on petioles about the same length ; flowers rather small, solitary, axillary, on short peduncles, yellow ; calyx broadly green-nerved.
Sierra Leone : Scarcies R., Sassemi, on rocks ! Exsicc.—*Sc. Elliot* 4535.

21 **H. Sabdariffa** *Linn.*—F.T.A. 1 : 204 ; Holl. 1 : 74 ; Chev. Bot. 67. Erect, slightly branched with smooth or slightly hispid stem, often coloured ; epicalyx and calyx sometimes with scattered hairs and tubercles, becoming succulent ; flowers an inch or more long, yellow with a purple centre.
Cultivated in Africa and other tropical countries, and variable in form and size. Exsicc.—*E. Vogel* 42 ; 52. *Burton. Sc. Elliot* 4173. *Dalz.* 68. *Chev.* 1250. (See Appendix).

22. **H. Whytei** *Stapf* in Journ. Linn. Soc. 37 : 79 (1905) ; Chev. Bot. 69. A tall woody herb, sparingly stellate-pubescent ; leaves 1½–3½ in. long ; epicalyx 10, narrow linear-lanceolate ; corolla yellow with purple centre, about 1½ in. long.
Sierra Leone : Kakatown ! Exsicc.—*Whyte.*

23. **H. congestiflorus** *Hochr.* in Ann. Cons. Jard. Bot. Gen. 10 : 21 ; Chev. Bot. 65. *H. Baumannii* Ulbrich. Erect undershrub, 5–10 ft. high, with pilose stems ; flowers yellow with purple centre, 1½–2½ in. long ; common in swamps.
Gold Coast : Accra ! Togo : Kpedsu (Dec.) ! Dahomey : Zagnanado (Feb.) ! N. Nigeria : Lokoja, Patti (Oct.) ! R. Benue ! Yola (Oct.) ! S. Nigeria : Lagos Colony ! Exsicc.—*Dalz.* 80. *Shaw* 70. Conservator of Forests, Lagos, 464. *Talb.* (no number). *Chev.* 22960 ; 23006. *Baumann* 400.

24. **H. owariensis** *P. de Beauv.* Fl. Oware 2 : 88, t. 117.—F.T.A. 1 : 203 (under *H. calycinus* Willd.). *H. calyphyllus* A. Chev. Bot. 64, not of Cav. A downy undershrub with long-stalked leaves, up to 6 ft. high ; epicalyx several-nerved ; flowers large, yellow with red-purple centre.
Ivory Coast ; between Kouroukoro and Touna (May) ! Gold Coast : ? locality ! Afaben (Aug.) ! Akwapim Hills (Aug.) ! S. Nigeria ; Lagos Colony (Dec.) ! Exsicc.—*Johnson* 110 ; 772. *Farmar* 534. *Rowland. Foster* 365. *Chev.* 21790.

25. **H. lonchosepalus** *Hochr.* in Ann. Cons. Jard. Bot. Genève 20 : 169 ; Chev. Bot. 66. A tall undershrub more or less resembling the preceding.
Dahomey : Agouagon (May) ! Exsicc.—*Chev.* 23540.

26. **H. lunariifolius** Willd.—F.T.A. 1 : 202 ; Holl. 1 : 72. *H. dongolensis* Del. *H. guineensis* Don ; Stapf 581. A very tall undershrub, coarsely stellate-pubescent becoming glabrous ; leaves long-stalked ; flowers large, yellow with a purple centre.
Sierra Leone : Sugar Loaf Mt. (Dec.) ! Koflu Mt. (Jan.) ! Liberia : St. Paul River ! S. Nigeria : Lagos Colony ! Calabar ! An Indian plant found also over most of tropical Africa. Exsicc.—*Sc. Elliot* 4031 ; 4612. *Reynolds* (no number). *Foster* 358. (See Appendix).

27. **H. grewioides** *Bak. f.* in Cat. Talb. Nig. Pl. 9. A small tree up to 16 ft. high.
S. Nigeria : Oban ; near Owum ! Exsicc.—*Talb.* 1343.

28 **H. Abelmoschus** *Linn.*—F.T.A. 1 : 207 ; Stapf 581 ; Holl. 1 : 69 ; Chev. Bot. 63. A tall hirsute perennial ; leaves 3–5-lobed, long-stalked ; flowers large, yellow, with a red-purple centre ; capsules 1½–2 in. long on long, rather slender stalks.
Found occasionally throughout the area ; a tropical weed cultivated in some countries. Exsicc.—*Roger. T. Vogel* 26. *Sc. Elliot* 4087 ; 4954. *Whyte. Brown* 784. *Thomas* 607 ; 3578 ; 5380.

29. **H. esculentus** *Linn.*—F.T.A. 1 : 207 ; Stapf 581 ; Holl. 1 : 71 ; Chev. Bot. 1 : 65–66. A cultivated herb, with long-stalked, usually 5-lobed leaves ; flowers large, yellow, with purple centre ; fruit up to 6 in. long, on short, stout stalks.
Naturalised in the tropics . (See Appendix).

30. **H. ficulneus** *Linn.* Sp. Pl. 695. A fibrous herb becoming woody below ; flowers pink ; capsule hairy.
N. Nigeria : mud flats near Dikoa, Lake Chad ! Also in Asia and Australia. Exsicc.—*Gosling. Lamb* 111. Possibly introduced and naturalised, but stated by Lamb to be wild.

10. GOSSYPIUM Linn.—F.T.A. 1 : 210 ; see Watt, Wild and Cultivated Cotton Pl. (1907) ; also in Kew Bull. 1926 : 193–210 ; 1927 : 321–356. (See Appendix).

Bracteoles united at the base :

Bracteoles with very few short teeth near the apex ; flowers red or purple ; leaves deeply divided up to ⅔ or ¾ of their length, only the middle main nerve with a gland ; calyx truncate or dentate ; seeds fuzzy below the cotton-wool ; capsule broadly ovoid, abruptly beaked, about 2·5 cm. long, usually 3-celled .. 1. *arboreum*

Bracteoles more or less deeply divided into several acute or acuminate segments ; flowers yellow, but often with a purple centre :

Petioles and main nerves of the leaves below clothed with long, spreading hairs ; lobes of leaves usually 5 ; bracteoles strongly nerved ; middle nerve only furnished with a gland ; seeds fuzzy below the cotton-wool ; capsule as in *arboreum*, but usually 4-celled .. .. 2. *obtusifolium* var. *Wightianum*

Petioles and main nerves of the leaves below only glandular or slightly and shortly pubescent :

Leaves and branchlets glabrous or nearly so except for the glands ; leaves small, 5-lobed nearly to the middle, lobes obtuse ; mostly 3 of the main nerves with a

gland ; seeds with fuzz below the cotton-wool ; capsule about 2 cm. long, very shortly beaked .. .. 3. *Simpsonii*

Leaves and branchlets shortly pubescent ; other characters more or less as in *G. Simpsonii*, which may only be a glabrescent form .. 4. *africanum*

Bracteoles quite free to the base :

Branchlets and petioles densely pilose with long, weak spreading hairs ; petals sometimes spotted but without a purple blotch at the base ; leaves entire and ovate-acuminate, or 3- or obscurely 5-lobed, the lobes triangular, acutely acuminate ; seeds with fuzz below the cotton-wool ; capsule usually 4-celled, about 3 cm. long 5. *hirsutum*

Branchlets and petioles glabrous or only slightly pubescent :

Seeds with a layer of fuzz below the cotton-wool, sometimes of a different colour :

Corolla small, only a little longer than the bracteoles ; petals sometimes with small blotches at the base ; leaves glabrous or nearly so, usually 3-lobed with ovate acuminate lobes, or if extra lobes then these much smaller ; calyx 5-toothed ; bracteoles very large ; capsule 4–5-celled . 6. *mexicanum*

Corolla about twice as long as the bracteoles ; petals with a large purple blotch at the base ; leaves pubescent, usually definitely 5-lobed with ovate-lanceolate acuminate segments ; calyx obscurely toothed ; bracteoles medium-sized ; capsule 3-valved, scarcely exceeding the accrescent bracteoles 7. *peruvianum*

Seeds without a layer of fuzz below the cotton-wool :

Seeds not agglutinated into a mass :

Leaves 3-lobed across the top with very wide sinuses, the terminal lobe equilateral with nearly straight sides ; branchlets purplish, glabrous except for the blackish glands ; calyx more or less toothed ; capsule scarcely exceeding the deeply lobed bracteoles .. .. 8. *purpurascens*

Leaves intrusively lobed with narrow sinuses and outwardly curved margins :

Leaf-lobes ascending, usually 3, rather long-acuminate ; flowers large, frequently thrice as long as the bracteoles .. .. 9. *vitifolium*

Leaf-lobes spreading, 3–5 ; flowers smaller than above, hardly more than twice as long as the bracteoles .. .. 10. *barbadense*

Seeds united into a "kidney mass" ; leaves large, deeply cordate at the base, palmately 3–5-lobed to beyond the middle, lobes ovate-lanceolate, gradually acutely acuminate ; bracteoles deeply divided, segments with long slender tips ; capsule 3-celled ; seeds slightly striate .. .. .. 11. *brasiliense*

1. **Gossypium arboreum** *Linn.*—F.T.A. 1 : 211 ; Watt, Wild and Cultivated Cotton Pl. 81, figs. 7 and 8, and in Kew Bull. 1926 : 194. *G. arboreum* var. *sanguineum* Watt ; Holl. 1 : 76 ; Chev. Bot. 70. A small tree or large shrub, 6–10 ft. high ; branchlets more or less purple-tinged, glabrous except when young ; leaves comparatively small.
Gold Coast : Gambaga, N. Terr. ! Togo : Kpedsu ! Dahomey. N. Nigeria : Nupe ! Egga ! Kazaure ! Ilorin ! Bassa ! S. Nigeria : Abeokuta ! Lagos Colony ! Oba ! Exsicc.—*Barter* 1182. *Irving* 3. *Rowland. Baikie. Millen* 132. *Elliott* 249. *Lamb* 3. *Thornton. Foster* 188. *Howse* 1099. *Imp. Inst.* H968/1912 ; 48487 ; H1258/1913.
2. **G. obtusifolium** Roxb., var. **Wightianum** Watt l.l.c.c. 143 and 203. Holl. 1 : 79. *G. herbaceum* Masters.—F.T.A. 1 : 211, partly, not of Linn. *G. abyssinicum* Watt in Kew Bull. 1926 ; 208. A hairy shrub 2–4 ft. high ; flowers fairly large, yellow, usually purple-blotched in the centre. N. Nigeria : Ilorin ! Nupe ! S. Nigeria : Abeokuta ! Exsicc.—*Irving* 2. *Barter* (no number). *Thornton.*
3. **G. Simpsonii** *Watt* in Kew Bull. 1926 : 199. A glabrescent shrub with purplish branches ; flowers smaller than in the preceding, yellow with purple centre.
N. Nigeria : Kano ! Also in Eastern Sudan and Angola. Exsicc.—*Lamb* 8. *Andrew* (ex Emp. Inst. 52808).
4. **G. africanum** *Watt* l.c. 205. *G. obtusifolium* var. *africanum* Watt, Wild and Cultivated Cotton Pl. 153, t. 23 ; Holl. 1 : 78. A shrub with spreading branches, 3–4 ft. high, like the preceding.
N. Nigeria : Bornu, on the banks of Komadugu Wobe ! Also in Eastern Sudan, and South and East tropical Africa. Exsicc.—*Elliott* 135.
5. **G. hirsutum** *Linn.*—Watt, Wild and Cultivated Cotton Pl. 183, tt. 29–31 ; Holl. 1 : 77. *G. punctatum* Sch. & Thonn. ; Watt l.c. 168, tt. 27–28, incl. vars. *nigeria* and *jamaica* Watt. *G. herbaceum* Masters.—F.T.A. 1 : 211, partly, not of Linn. ; Holl. 1 : 79. A hairy shrub, sometimes of short stature, occasionally straggling and up to 10–12 ft. high ; flowers medium-sized.
Gambia : Georgeton (Jan.) ! Sierra Leone : Freetown ! Moyamba ! Gold Coast : Winnebah (Feb.) ! Anum ! Akuse ! Labolabo ! Togo : Kpedsu ! N. Nigeria : Bornu, Kuka ! S. Nigeria : Badagry ! Exsicc.—*E. Vogel* 35. *Barter* (no number). *Dudgeon* 3 ; 7. *Johnson* ii. ; iii. ; 1073. *Higginson. Howes* 1100.
6. **G. mexicanum** *Tod.*—Watt l.c. 226, tt. 39–42 ; Holl. 1 : 78. A shrub, slightly loosely hairy on the young branchlets, becoming glabrous.
Sierra Leone : S Prov. (Feb.) ! Gold Coast : Labolabo ! N. Nigeria : Nupe ! Exsicc.—*Barter* 1184. *Dudgeon* 136. *Dawe* 468.
7. **G. peruvianum** *Cav.*—Watt l.c. 213, tt. 37–8 ; Holl. 1 : 79. *G. barbadense* Masters.—F.T.A. 1 : 210, partly, not of Linn. A shrub with long flexuose, often angular branches, and large yellow flowers, often drying greenish.
Sierra Leone : Freetown ! Moyamba ! Kaballa ! N. Province ! Liberia : Kakatown ! Gold Coast : Kumasi ! Anum ! Togo : Lome ! S. Nigeria : Lagos to Ijaye ! Abeokuta ! Exsicc.—*Irving* 1. *Barter* 3349. *Brown. Whyte. Cummins* 18F. *Johnson* 1. *Dudgeon* 8. *Glanville. Warnecke* 18
Watt distinguishes two varieties, var. *zaria* and var. *Irvingianum*. (See Kew Bull. 1927 : 335–337).
8. **G. purpurascens** *Poir.*—Watt l.c. 250, t. 44. A straggling shrub ; flowers rather small, yellow or purplish, often deeply stained in the centre.
French Sudan ; Goundam ! Gambia : Busumballa ! Exsicc.—*Dudgeon* (no number). *Chev.* 2732.
9. **G. vitifolium** *Lamk.*—Watt l.c. 255, tt. 1 and 45. *G. barbadense* Masters, F.T.A. 1 : 210, partly, not of Linn. ; Holl. 1 : 79. A shrub with diffuse spreading, purple, often angular branches, glabrous when mature, 10 ft.

high; flowers very large, canary yellow with purple centre; capsule 3–5-valved; sometimes difficult to distinguish from *G. peruvianum*.
Senegal! Gold Coast: Sittam, E. Akim! Togo: Kpedsu! N. Nigeria: Ankpa (Feb.)! Exsicc.—*Roger*. *Dudgeon* 1. *Howes* 1095. *Lamb* 17.

10. **G. barbadense** *Linn.*—Watt l.c. 265, t. 46; F.T.A. 1: 210, partly; Holl. 1: 76. A shrub more or less like the preceding; flowers medium-sized, yellow, generally diffusely purple-stained in the centre; capsule usually 3-, sometimes 4-valved.
Gold Coast: Labolabo! S. Nigeria: Ikure! Exsicc.—*Holl.* 250. *Dudgeon* 5.

11. **G. brasiliense** *Macf.*—Watt l.c. 295, tt. 49, 50. A shrub or sometimes a small tree, with purple, often angled branches; leaves often drying dark brown; flowers very large, yellow changing to pink, with orange or scarlet spots at the centre; in general resembling *G. vitifolium*, but seeds conglomerate.
S. Nigeria: Abeokuta! Lagos Colony! Fernando Po! Exsicc.—*T. Vogel* 20. *Irving* 102. *Millen* 28.

11. KOSTELETZKYA Presl.—F.T.A. 1 : 193.

Leaves linear to linear-lanceolate, narrowed to the base, up to 12 cm. long and 1·3 cm. broad, the lower ones often hastate at the base, serrulate, scabrid on both surfaces; petiole very short, about as long as the stipules; flowers solitary, axillary; pedicels up to 3 cm. long, jointed near the top; epicalyx of 7–10 linear bracts a little shorter than the calyx; fruits depressed, pentagonal, about 1·3 cm. broad, bristly pilose all over; seeds densely papillose all over .. .. 1. *flava*

Leaves pentagonal, broad at the base, about 7 cm. in diam., glabrescent, crenate; petiole nearly as long as the leaf; stipules linear, small; flowers in small axillary cymes; epicalyx of about 7 linear bracts, shorter than the calyx; fruits depressed, very prominently 5-angled, bristly only on the angles; seeds minutely muricate 2. *stellata*

Leaves suborbicular, widely cordate at the base, slightly 3-lobed, 5–6 cm. diam., softly stellate-pilose, doubly dentate; petiole about ¼ as long as the leaf; stipules filiform, about 8 mm. long; flowers densely clustered at the ends of the shoots, forming a spike-like panicle; epicalyx of 8–10 filiform pilose bracts as long as the calyx; fruits depressed, 5-angled, bristly pilose all over; seeds faintly lined 3. *Chevalieri*

1 **Kosteletzkya flava** *Bak. f.* ex *Scott Elliot* in Journ. Linn. Soc. Bot. 30: 74 (1894). *K. Buettneri* Gürke. *K. Augusti* Hochr.—Chev. Bot. 63. An erect, scabrid fibrous perennial, 2–3 ft. high; flowers white with pink veins, turning yellow, over 1 in. in diam.
Sierra Leone: Erimakuna, in wet soil (Mar.)! N. Nigeria: Bauchi Plateau, Panyam, 4,500 ft. (July)! Extends to Eastern Sudan, Angola, S.W. Africa and Rhodesia.

2. **K. stellata** *Hutch. & J. M. Dalz.* in Kew Bull. 1928; ined. *Hibiscus solandra* A. Chev. Bot. 67, not of L'Hérit. Erect, fibrous perennial, up to 14 ft. high; flowers pink, about ¾ in. in diam.
Gold Coast: Anum (Nov.)! Dahomey: Abbo (Feb.)! S. Nigeria: Iddo Island (fr. Dec.)! Ebute Metta! Exsicc.—*Johnson* 816. *Millen* 44; 53. *Chev.* 22965.

3. **K. Chevalieri** *Hochr.* in Ann. Cons. & Jard. Bot. Genève 10: 22; Chev. Bot. 63. *Hibiscus Grantii* Mast. (not *Kosteletzkya Grantii* Garcke).—F.T.A. 1: 203. Erect herb with rod-like stems about 4 ft. high, densely strigose-hispid; flowers pinkish.
French Guinea: Futa Jallon, between Soumbalaka and Boulivel (Sept.)! Sierra Leone: Musala (Oct.)! N. Nigeria: Kontagora (Oct.)! Extends to Nile Land, Uganda, Congo and Angola. Exsicc.—*Chev.* 18661. *Dalz.* 130. *Thomas* 2609.

12. MALVASTRUM A. Gray—F.T.A. 1 : 177.

Woody herb; branches with loose long appressed branched hairs; leaves with slender petioles, ovate, coarsely serrate, more or less rounded at the base, 3–5 cm. long, 2–2·5 cm. broad, laxly pilose on the upper surface with simple hairs, hairs branched below; flowers single or crowded, shortly stalked; epicalyx of 3 narrow bracts; calyx-lobes broadly lanceolate, acute; carpels 8–12, with 3 sharp points at the apex and on the sides, laxly pilose .. .. *tricuspidatum*

M. tricuspidatum *A. Gray* Plant. Wright. 16.—F.T.A. 1: 178. *M. coromandelianum* A. Chev. Bot. 56, not of Garcke. Erect, 2–3 ft.; flowers yellow.
Gold Coast: Accra (Mar.)! Dahomey: Porto-Novo (Jan.)! N. Nigeria: Aguji! S. Nigeria: Lagos Colony! Ibadan (Mar.)! Widely distributed in the tropics. Exsicc.—*Rowland. Thornton. Golding* 3; 18. *Deighton* 543.

74. MALPIGHIACEAE

Trees, shrubs or climbers, usually clothed with appressed medifixed hairs. Leaves opposite or rarely alternate, simple; a pair of glands often present at the base of the blade; stipules present or absent, sometimes connate. Flowers mostly hermaphrodite, actinomorphic. Sepals 5, imbricate or rarely valvate, often biglandular outside. Petals 5, clawed. Disk small. Stamens 10, hypogynous; filaments free or connate at the base; anthers 2-celled, opening lengthwise. Carpels usually 3, free or connate into a 3-celled ovary; cells 1-ovuled; styles usually separate and spreading. Fruiting carpels mostly winged or carpels connate into a fleshy or woody drupe. Seeds without endosperm and with straight, curved or uncinate, rarely circinate embryo.

A distinct and mainly tropical family, most highly represented in tropical America; the medifixed hairs, glandular calyx-lobes and samaroid fruit are almost constant features of the few represented in our area.

Leaves alternate:

Samara more or less oblanceolate or obovate, the wing arising from the upper part of the fruit body .. .. 1. **Acridocarpus**

Samara elliptic-suborbicular, the wing surrounding the outer side of the fruit body 2. **Rhinopteryx**

Leaves opposite:

Sepals closed over the petals in bud .. .. 3. **Flabellaria**

Sepals open in bud, the petals conspicuous:

Wing of samara very small, the latter nut-like .. .. .. 4. **Brachypterys**

Wing of samara large:

Samara broadly elliptic; calycine glands large and fleshy .. 5. **Banisteria**

Samara shield-like, orbicular; calycine glands absent .. .. 6. **Triaspis**

1. ACRIDOCARPUS Guill. & Perr.—F.T.A. 1: 277; Sprague in Journ. Bot. 1906: 192.

Bracts spathulate-oblanceolate, 4–5 mm. long, soon becoming reflexed, persistent: inflorescence much-branched with curved spreading branches, rusty-tomentellous; leaves more or less obovate, rounded or slightly pointed at the apex, 8–14 cm. long, 4–7 cm. broad, pubescent on the midrib below; samara about 6 cm. long, 2 cm. broad, obliquely oblanceolate .. .. 1. *plagiopterus*

Bracts usually small and subulate (rarely short and ovate), acute, not becoming reflexed; inflorescence not or only a little branched:

Leaves below and usually the branches glabrous or the midrib sometimes shortly pubescent:

Leaves oblong, more or less rounded or very obtuse at the base:

Flowers racemose, numerous; pedicels up to 2 cm. long; sepals corrugated outside; leaves 12-20 cm. long, up to 8 cm. broad, coarsely reticulate below; samara oblong, about 5 cm. long .. .. 2. *longifolius*

Flowers subcorymbose, few; pedicels about 1·5 cm. long; sepals slightly corrugated; leaves narrowly oblong, up to 17 cm. long and 5 cm. broad, rather finely reticulate below; samara narrowly oblanceolate, 3·5 cm. long, 1 cm. broad 3. *alternifolius*

Leaves oblanceolate, obovate-oblanceolate or obovate, more or less cuneate at the base:

Leaves broadly obovate, about 18 cm. long and 8 cm. broad, cuneate at the base, with about 9 pairs of strong lateral nerves and few tertiary nerves; racemes elongated, thinly pubescent; bracts very small; pedicels very short, about 6 mm. long; samara oblanceolate, 5 cm. long and 1·5 cm. broad 4. *Staudtii*

Leaves obovate-oblanceolate or oblong:

Leaves acuminate, oblong or narrowly obovate-oblanceolate, more or less narrowed to the base, 6–12 cm. long, 3–5 cm. broad, glabrous; lateral nerves about 6 pairs, much-branched; flowers racemose or subpaniculate; pedicels up to 1·5 cm. long, slightly pubescent; samara oblanceolate, 5 cm. long, 1·5 cm. broad .. .. 5. *Smeathmannii*

Leaves rounded or very slightly pointed at the apex, oblong, shortly cuneate at the base, 8–13 cm. long, 2–5 cm. broad, glabrous; lateral nerves about 8 pairs; flowers subcorymbose; pedicels 1·5 cm. long, pubescent; anthers 4 mm. long 6. *Chevalieri*

Leaves below and branches more or less tomentose or pubescent; leaves obovate-oblanceolate, rounded at the top and mucronate, about 9 cm. long and 4 cm. broad, thinly pubescent below, with about 10 pairs of lateral reticulate nerves; flowers laxly racemose; pedicels 3 cm. long, becoming hooked at the top, tomentellous; samara narrowly oblanceolate, 7 cm. long, 1·5 cm. broad .. .. 7. *Hirundo*

1. **Acridocarpus plagiopterus** *Guill. & Perr.* Tent. Fl. Seneg. 1: 123, t. 29; F.T.A. 1: 278; Sprague in Journ. Bot. 1906: 206; Chev. Bot. 95. A shrub up to 20 ft. high, usually climbing, with rusty puberulous branchlets, yellow flowers and fruit winged like the maple and often wine-red in colour.
Senegal! French Guinea and Sierra Leone, common. Exsicc.—*Heudelot* 761. *G. Don. Afzelius. Winwood Reade. Sc. Elliot* 3870. *Smythe* 69.

2. **A. longifolius** *Hook. f.* Nig. Fl. 244; Sprague l.c. 204. *A. Smeathmannii* var. B, Oliv. F.T.A. 1: 278. A glabrous shrub, often more or less climbing, with flowers and fruit like the last.
Liberia: near Gwampa (fr. Sept.)! S. Nigeria: Lagos, Ikoyi, etc. (July)! Brass! Nun R.! Eket! Fernando Po (Dec.)! Also in St. Thomas' Island, Cameroons, Congo and Angola. Exsicc.—*T. Vogel* 125; 195. *Barter* 2196; 3701. *Mann* 467. *Millen* 145. *Talb.* 3096 *Linder* 822.

3. **A. alternifolius** *Niedenzu* in Arb. Bot. Inst. Braunsberg 6: 53. *A. corymbosus* Hook f.—F.T.A. 1: 278; Sprague l.c. 203; Chev. Bot. 95. A scrambling shrub, like the preceding.
Sierra Leone: Freetown (June)! Kumrabai (fr. Dec.)! Ivory Coast: Dabou, in savannah. Gold Coast: Dixcove (Apr.)! Cape Coast (July)! Accra (Mar.)! N. Nigeria: Nupe! Jebba! Lokoja (Oct.)! Exsicc.—*T. Vogel* 12; 177. *Barter* 507. *Brown* 337.

4. **A. Staudtii** *Engl.* mss. *A. Smeathmannii* var. *Staudtii* Engl.; Sprague l.c. 204.
S. Nigeria: Johann-Albrechtshöhe, by the lake (fl. and fr. Dec.–Jan.)! Exsicc.—*Staudt* 498.

FIG. 113.—ACRIDOCARPUS SMEATHMANNII *G. & P.* (MALPIGHIACEAE).

A, base of leaf showing glands. B, flower-bud. C, flower. D, petal. E, stamen from front. F, stamen from back. G, pistil. H, cross section of ovary. I, fruit.

A. Smeathmannii *Guill. & Perrot.*—F.T.A. 1 : 277, partly (var. *a*) ; Sprague l.c. 204, excl. var. *Staudtii* Engl. Habit of the others.
Sierra Leone : common ! Gold Coast : Accra Plains (Feb.) ! Koforidua (Dec.) ! Togo : Lome ! S. Nigeria : Lagos, Ikoyi, etc. (Oct.) ! Lagos Colony ! Niger R. ! Exsicc.—*Don. Afzelius. Barter* 2137 ; 2217. *Johnston* 48. *Johnson* 497 ; 613. *Moloney. Rowland. Smythe* 247. *Sc. Elliot* 4661. *Warnecke* 401.

6. **A. Chevalieri** *Sprague* in Journ. de Bot. 22 : 24 ; Chev. Bot. 95. A climbing shrub with yellowish or rusty pubescent branchlets and inflorescence.
French Sudan : Koulikoro, on bank of the Niger (Oct.) ! Exsicc.—*Chev.* 3144.

7. **A. Hirundo** *S. Moore* in Journ. Bot. 1880 : 1. A climbing shrub with rusty-tomentose branchlets and inflorescence ; flowers yellow, conspicuous.
Liberia : ? locality ! Taniné (Sept.) ! Exsicc.—*Carder. Linder* 824.

2. RHINOPTERYX Niedenzu in Engl. & Prantl, Nat. Pflanzenf. 3, 4 : 352.

Shrubs or small trees :

Branchlets pubescent ; leaves alternate, sessile, oblong-elliptic or elliptic, rounded or very slightly acuminate at the apex, rounded at the base, 8–15 cm. long, 4–8 cm. broad, very coarsely reticulate and thinly pubescent below, with about 8–9 pairs of lateral nerves ; racemes stout, about 30 cm. long, densely flowered ; pedicels 2 cm. long, pubescent ; sepals broadly elliptic, glabrous on the margin ; petals nearly 1·5 cm. long ; samara elliptic-orbicular, the wing all round the side of the fruit-body, slightly pubescent, 4 cm. long .. .. 1. *spectabilis*

Branchlets nearly glabrous ; leaves alternate, subsessile, narrowly oblong or oblong-oblanceolate, triangular-acuminate, subacute at the base, 10–17 cm. long, 2·5–4·5 cm. broad, coarsely reticulate and slightly pubescent below, with about 10 pairs of much-branched lateral nerves ; racemes about 20 cm. long, thinly pubescent ; pedicels 2 cm. long, pubescent ; sepals broadly ovate, glabrous towards the margin ; samara orbicular-elliptic, the wing all round one side of the fruit body, about 6 cm. long, slightly pubescent .. .. 2. *angustifolia*

Stems short from a rhizome ; shortly pilose ; leaves oblong, acute, 13 cm. long, 3–5·5 cm. broad, densely reticulate ; racemes lax-flowered, densely pilose ; petals 1·2 cm. long ; samara semicordate, 6 cm. long and 3·5 cm. broad .. ... 3. *Kerstingii*

1. **R. spectabilis** *Niedenzu* l. c. *Acridocarpus hemicyclopterus* Sprague. A shrub or ? small tree with yellow or ? white flowers and broadly winged fruit.
Gambia ! Exsicc.—*Brown-Lester* 47 ; 50. *Ozanne* 5.

2. **R. angustifolia** *Sprague* in Kew Bull. 1922 : 194. A small tree with red-brown branchlets and white flowers.
Gold Coast : North Territory, Lorha (fr. Feb.) ! Exsicc.—*McLeod* 815.

3. **R. Kerstingii** *Hutch. & J. M. Dalz.* in Kew Bull. 1928 : ined. *Acridocarpus Kerstingii* Engl. Stems erect from a woody rhizome ; fruit-wings yellow.
French Guinea ! Togo : Sokode-Basari, open savannah near Bangeli (fr. Mar.). Exsicc.—*Kersting* 507. *Pobéguin* 2143 Type not seen ; perhaps a reduced state of the preceding.

3. FLABELLARIA Cav.—F.T.A. 1 : 282.

Climbing shrub ; branchlets appressed-pubescent ; leaves opposite, ovate or ovate-orbicular, obtuse or subacute, 10–14 cm. long, up to 10 cm. broad, glabrous above, appressed-silky-tomentose below ; lateral nerves about 4–5 pairs ; petiole 1·5–2 cm. long, tomentose ; panicles terminal, lax, many-flowered ; bracts oblanceolate ; pedicels 8–10 mm. long ; sepals closed in bud, 4 mm. long ; petals entire, glabrous ; wings of fruit together suborbicular, about 3–6 cm. diam. .. .. *paniculata*

F. paniculata *Cav.*—F.T.A. 1 : 282 ; Stapf 584. A climbing shrub with grey-silky branchlets and leaves, and white or light pink flowers.
Fairly common from French Guinea (Futa Jallon) to Cameroons and Fernando Po, and extending to Angola and in Uganda. Exsicc.—*Heudelot* 848. *T. Vogel* 99. *Barter* 1337 ; 3422. *Thomson* 99. *Sc. Elliot* 5640 ; 5728. *Rowland. Millen* 107 ; 179. *Farmar* 525. *Talb.* 3722. *Whyte ; Pobéguin* 672. *Chev.* 13441. (See Appendix).

4. BRACHYPTERYS A. Juss. in Ann. Sci. Nat. 2, 13 : 290 (1840).

Branchlets finely appressed-pubescent ; leaves opposite, lanceolate, obtusely pointed, shortly cuneate at the base, about 7 cm. long and 2·5 cm. broad, minutely appressed-pubescent below ; lateral nerves about 6 pairs, slender and inconspicuous ; flowers few, at the ends of short lateral branchlets ; pedicels about 2 cm. long, glabrous ; sepals with 2 large contiguous glands in the lower part ; petals with a long claw, suborbicular, about 1·5 cm. long, crenulate ; stamens 10 ; styles 3, distinct ; samaras 2–3 together, nut-like, with a very small wing .. .. *ovata*

B. ovata *Small* in North Amer. Fl. 25 : 138. *B. borealis* A. Juss. *Banisteria ovata* Cav. A creeper over mangroves.
Sierra Leone : 5 miles above Mahela (Dec.) ! Also in Central America and East Tropical America. Exsicc.—*Sc. Elliot* 4089.

5. BANISTERIA Linn. Syst. ed. 2 : 23 (1740).

Branchlets lenticellate ; leaves opposite, oblong-elliptic, shortly acuminate, rounded at the base, 12–20 cm. long, 5–8 cm. broad, thinly pubescent below, at length glabrous but densely papillose ; lateral nerves about 10 pairs, much branched ; petiole 1 cm.

long, thicker at the base; panicles terminal, about 10 cm. long, rusty-tomentose; bracts ovate, 4 mm. long; calycine glands very large and fleshy; stamens 10; samaras 1–3, broadly obliquely elliptic, about 2·5 cm. long, tomentellous *leona*

B. leona *Car.* Diss. 9: 424, t. 247 (excl. fruits). *Heteropteris africana* A. Juss.—F.T.A. 1: 276; Stapf 584; Chev. Bot. 95. A glabrous climbing shrub with coriaceous leaves, yellow flowers and red-winged fruits.
French Guinea: Rio Nunez! Sierra Leone; common, chiefly in the coastal districts and sometimes near mangroves! Liberia: Grand Bassa (July)! Monrovia! Sino Basin! Ivory Coast: Assinie; Prolo to Bliéron, on the Lower Cavally; at mouth of Cavally, near the sea. S. Nigeria: Lagos, Ikoyi, etc. (Aug., Sept.)! Brass! Akassa (Aug.)! Bonny (Oct.)! Calabar! Oban! Victoria! South to Congo and Angola. Exsicc.—*Heudelot* 892. *T. Vogel* 62; 117; 187. *Barter* 29. *Mann* 462. *Garret. Millen* 160. *Whyte. Preuss* 1322. *Linder* 1408.

6. TRIASPIS Burchell—F.T.A. 1: 280.

Stipules persistent, foliaceous, reniform, 1–1·5 cm. long, silky below; leaves opposite, ovate to ovate-lanceolate, acuminate, rounded at the base, 8–15 cm. long, 5–9 cm. broad, thinly long-appressed-pilose below; petiole about 1 cm. long; panicles rather lax-flowered, with large leafy bracts; pedicels about 1·5 cm. long; sepals elliptic, pubescent, 3 mm. long; petals glabrous; wings of fruit together orbicular, about 5–6 cm. diam., glabrous .. .. 1. *stipulata*

Stipules small and deciduous; leaves ovate-elliptic, very shortly acuminate, cordate at the base, 7–8 cm. long, 4·5–5·5 cm. broad, densely appressed-villous below; petiole 1·5 cm. long, tomentose; panicles rather small and densely flowered; pedicels about 1 cm. long, tomentose; sepals oblong, tomentose; petals glabrous; wings of fruit together suborbicular, cordate at the base, about 2·5 cm. diam., glabrous
2. *odorata*

1. **T. stipulata** *Oliv.*—F.T.A. 1: 281. A woody climber with brownish-pilose branchlets and inflorescence; flowers white or pinkish in abundant panicles.
Togo: Misahöhe (Nov.)! S. Nigeria: Abeokuta! Ebute Metta! Ikirun (fr. Feb.)! Lagos Colony! Cameroons, Victoria to Bota (Feb.)! Also in French Cameroons. Exsicc.—*Irving* 99. *Millson. Rowland. Millen* 71; 83. *Dalz.* 8173. *Mildbr.* 7323.
2. **T. odorata** *A. Juss.*—F.T.A. 1: 280. *T. aurea* Niedenzu. A climbing shrub with rusty-tomentose branchlets and red flowers.
Gold Coast: Addah; Mansu! Accra. Togo: Lome (Nov.)! Exsicc.—*Cummins* 9. *Warnecke* 251. *Mildbr.* 7511. *Krause* 5.

75. HUMIRIACEAE

Trees or shrubs. Leaves alternate, simple; stipules absent. Flowers hermaphrodite, actinomorphic. Sepals 5, imbricate, shortly or wholly connate. Petals 5, free, soon falling away, slightly imbricate-contorted. Stamens 10 or more, hypogynous, more or less connate in the lower part; anthers versatile, 2–4-celled, opening lengthwise. Disk annular and often toothed, or of separate glands, surrounding the base of the ovary. Ovary free, sessile, 5–7-celled; style simple; ovules 1–3, pendulous from the apex, anatropous. Fruit a drupe with rather thin fleshy pericarp and hard endocarp, sometimes with numerous resin-filled cavities. Seeds 1–2 in each cell; embryo straight in the middle of copious endosperm; cotyledons short.

A small family confined to tropical America and Africa. Recognised by the exstipulate leaves, stamens 10 or more, partially connate, style undivided.

SACCOGLOTTIS Mart.—F.T.A. 1: 275, as *Aubrya* Baill.

Trees; leaves leathery, glabrous, toothed. Flowers in axillary cymes. Ovary 5-celled; style simple; ovules solitary. Fruit with a thick woody pericarp with resin-filled cavities.

A large tree, 80 ft. or more; branchlets with the bark splitting lengthwise; leaves oblong-elliptic, shortly cuneate at the base, obtusely acuminate, 10-15 cm. long, 3–6 cm. broad, coriaceous, crenulate, glabrous, reticulate on both surfaces, with rather numerous much-branched lateral nerves; petiole about 0·5 cm. long, swollen at the base; cymes axillary, many-flowered, about ½ as long as the leaves; pedicels very short, stout; calyx pubescent, 2 mm. long, with broad, almost truncate lobes; petals slightly imbricate, shortly pubescent except on the margin; fruit hard, ellipsoid, 3–4 cm. long, 2·5 cm. diam., with numerous unequal resin-filled cavities
gabonensis

S. gabonensis *Urban* in Mart. Fl. Bras. 12, 2: 449. *Aubrya gabonensis* Baill.—F.T.A. 1: 275; Holl. 1: 121. *A. occidentalis* Chev. Bot. 94, name only. A timber tree; common in the forests; girth up to 15 ft.
Sierra Leone: Gola Forest! Ivory Coast: Dabou (Feb.)! Bingerville (Feb.). S. Nigeria: Brass (June)! Onl! Fernando Po! Also in French Cameroons and Gabon. Exsicc.—*Barter* 68. *Mann* 1417. *Chev.* 16195. (See Appendix).

76. ERYTHROXYLACEAE

Trees, shrubs, or undershrubs. Leaves alternate, rarely opposite, simple, entire; stipules intrapetiolar, rarely extrapetiolar, often caducous. Flowers fasciculate, hermaphrodite, rarely subdioecious, hypogynous, actinomorphic. Calyx persistent, campanulate, lobes 5, imbricate. Petals 5, free, deciduous, imbricate, mostly ligulate on the inside. Stamens 10, in 2 series, more or less connate at the base; anthers ellipsoid, 2-celled, opening lengthwise. Ovary of 3 carpels, 3-celled, mostly two of the cells sterile, fertile cells 1–2-ovuled; ovules pendulous; styles 3, free or more or less connate; stigmas oblique, depressed-capitate or clavate. Fruit drupaceous; seeds with or without endosperm; embryo straight.

A small family sparsely represented in Africa. Stipules mostly intrapetiolar; petals with a scale on the inside.

FIG. 114.—SACCOGLOTTIS GABONENSIS *Urban* (HUMIRIACEAE).

A, flower-bud. B, longitudinal section of flower. C, D, stamen front and back. E, cross section of ovary. F, fruit.

ERYTHROXYLUM Linn.—F.T.A. 1 : 273.

Shrubs or small trees. Leaves alternate, entire; stipules intrapetiolar. Flowers small, pedicellate, in axillary fascicles. Sepals usually 5. Petals as many, imbricate, with a scale on the inner side. Stamens 10. Ovary 3–4-celled; styles 3 or 4. Fruit a drupe.

Leaves oblanceolate to narrowly obovate, slightly narrowed to the very obtuse emarginate apex, 3–8 cm. long, 2–3 cm. broad, shining above and reticulate on both surfaces; stipules triangular-ovate, keeled, 4 mm. long; flowers small, 1–4 in clusters on stout pedicels about 5 mm. long; sepals triangular, obtuse 1. *emarginatum*

Leaves obovate, rounded at the apex, 3–6 cm. long, 1·5–2·5 cm. broad, slightly shining above and laxly reticulate on both surfaces; stipules curved inside the petiole, becoming hardened; flowers several in clusters, on rather slender pedicels about 1 cm. long; sepals triangular, acute; young fruits arcuate, about 1 cm. long 2. *Mannii*

1. **E. emarginatum** *Sch. & Thonn.*—F.T.A. 1 : 274; Chev. Bot. 94; O. E. Schulz in Engler Pflanzenr. *Erythroxalac.* 135. A glabrous shrub or small tree; flowers white, fragrant; fruit red.
Gold Coast: Krepi (Jan.)! Dahomey: Abomey (Feb.)! N. Nigeria: Nupe! S. Nigeria: Ijaye! Olokemeji! Exsicc.—*Barter* 1650; 3421. *Johnson* 560.
2. **E. Mannii** *Oliv.*—F.T.A. 1 : 274; O. E. Schulz l.c. 124. A glabrous tree.
Sierra Leone: Bagroo River! Also in French Cameroons. Exsicc.—*Mann* 850.

77. EUPHORBIACEAE

Trees, shrubs or herbs, occasionally with milky juice. Leaves alternate or rarely opposite, simple or digitately compound, sometimes reduced, mostly stipulate. Flowers unisexual, mostly monoecious. Sepals imbricate or valvate, or in very specialised inflorescences much reduced or absent. Petals absent or rarely present and sometimes united. Stamens 1–1,000, free or variously connate; anthers 2–4-celled, erect or inflexed in bud, opening lengthwise, rarely by pores. Rudimentary ovary often present in the male flowers. Ovary mostly 3-celled; styles free or united at the base; ovules solitary or paired, pendulous from the inner angle of the cells. Fruit a capsule or drupe. Seeds often with a conspicuous caruncle; endosperm copious, fleshy; embryo straight.

A large and heterogeneous family, mainly in the tropics and subtropics; flowers much reduced and mostly apetalous; allied to *Sterculiaceae*, *Flacourtiaceae*, *Celastraceae*, and perhaps *Sapindaceae*.

The following is usually cultivated or occasionally naturalised:

Hura crepitans Linn., a tree 50–80 ft. high, branches armed with strong spines; leaves long-petiolate, ovate, cuspidate-acuminate, biglandular at the base, with strong numerous lateral nerves, villous on the midrib below; male flowers in terminal spikes, deep red, with the anthers usually in 2–3-whorls sessile on a central column; female flower solitary; calyx truncate; style stout, long, dilated in a multifid disk-like stigma; fruit depressed-globose, the whorled woody cocci separating explosively from the columella, 6–8 cm. broad; var. *senegalensis* Müll. Arg. has the midrib glabrous below.

Key to the tribes.

Male and female flowers not enclosed in a common involucre; stamens usually more than 1:
Ovary-cells 2-ovuled
I. PHYLLANTHEAE
Ovary-cells 1-ovuled:
Petals present; stamens 1-seriate, opposite the sepals; flowers very small in axillary fascicles
II. GALEARIEAE
Petals present or absent; stamens 1–2-seriate, the outer alternate with the sepals or all more or less central, sometimes very numerous
III. CROTONEAE
Male and female flowers much reduced and enclosed in a common involucre; stamens 1; perianth usually absent or rim-like, rarely cupular
IV. EUPHORBIEAE

Tribe I.—PHYLLANTHEAE

Leaves digitately compound, opposite; leaflets stalked; flowers dioecious; petals absent; stamens 4–10 .. .. 1. **Oldfieldia**
Leaves simple:
Sepals of the male flowers valvate in bud:
Flowers in racemes; petals absent; ovary-cells partially divided by a false septum 6. **Martretia**
Flowers in axillary fascicles or glomerules, rarely in spicate clusters or very short racemes; petals usually present; ovary-cells not divided:
Fruit drupaceous; ovary 2-celled; tertiary nerves of the leaves usually parallel; petals 5, small, scale-like; stamens 5, connate in their lower part .. 2. **Bridelia**
Fruit a capsule; ovary 3-celled; tertiary nerves not parallel; petals 5, small or absent; stamens as above .. .. 3. **Cleistanthus**
Sepals of the male flowers imbricate in bud:
Petals present in the male flowers:
Inflorescence spicate, racemose or fasciculate:
Styles absent; stigmas sessile, thick, entire; flowers monoecious; stamens 5, filaments free; fruit a capsule .. .. 4. **Amanoa**
Styles well developed, usually divided; flowers dioecious; stamens 5, filaments free; fruit a trilobed capsule .. .. 9 **Thecacoris**
Inflorescence paniculate; capsule ellipsoid, entire, loculicidal; stigmas reflexed, entire; flowers dioecious .. .. 5. **Spondianthus**

Petals absent from the male flowers :
Male flowers in spikes or racemes, not in an involucre of bracts :
Fruits not winged ; disk present in both sexes or rarely absent from the female ; leaves not glandular below :
Stems perennial ; much-branched trees or shrubs :
Ovary 2-celled, each cell divided by a false septum ; styles 2, connate at the base, undivided .. .. 6. **Martretia**
Ovary cells not divided ; styles bifid or bilobed :
Ovary 4-celled ; male spikes fasciculate, axillary .. .. 7. **Apodiscus**
Ovary 2–3-celled :
Bracts subtending the male flowers in 3 series, the middle bract cupular and enclosing the flower in bud ; disk of the female flower adnate to the sepals ; flowers dioecious ; capsule large, septicidal .. .. 8. **Protomegabaria**
Bract subtending the male flowers solitary ; disk in the female not adnate to the sepals :
Fruits depressed-globose, trilobed, 3-celled, dehiscing into 2-valved cocci 9. **Thecacoris**
Fruits entire, 1-celled by abortion .. .. .. 10. **Maesobotrya**
Ovary 1-celled ; fruit drupaceous ; flowers small, in slender catkin-like inflorescences .. .. 11. **Antidesma**
Stems annual, mostly simple, arising from a woody rhizome ; flowers dioecious ; capsule trilobed .. .. 12. **Cyathogyne**
Fruits broadly winged, flat ; leaves glandular below ; male inflorescence a catkin-like spike, female shortly racemose ; styles 2, free from the base 13. **Hymenocardia**
Male flowers in axillary glomerules or fascicles, rarely in racemes of fascicles or solitary in the leaf-axils :
Disk in the male flowers central ; fruit indehiscent :
Stamens inserted around and at the base of the central disk ; flowers sometimes on the old wood, dioecious .. .. 14. **Drypetes**
Stamens inserted on and amongst the folds or lobes of the central disk, the lobes often surrounding the base of each filament and resembling a small fleshy perianth ; flowers always axillary, dioecious .. .. 15. **Lingelsheimia**
Disk in the male flowers not central ; fruit usually dehiscent :
Rudimentary ovary absent from the male flowers ; flowers usually monoecious 16. **Phyllanthus**
Rudimentary ovary present in the male flowers, deeply 2–3-partite ; flowers dioecious .. .. 17. **Flueggea**
Male flowers in a globose head surrounded by calycine bracts ; female solitary in an involucre of bracts ; fruit indehiscent, containing 3–4 pyrenes .. 18. **Uapaca**

Tribe II.—Galearieae

Flowers very small in axillary fascicles ; fruit a small indehiscent drupe ; disk absent ; rudimentary ovary present in the male flowers ; shrub with pellucid-dotted leaves 19. **Microdesmis**

Tribe III.—Crotoneae

Leaves digitately compound, with separate leaflets :
Petals absent from the male flowers, the latter paniculate ; fruit a capsule ; introduced rubber (Para) trees from S. America .. .. 20. **Hevea**
Petals present and connate in the male flowers ; fruit indehiscent ; indigenous, not rubber-producing trees with stout branchlets ; stipules broad, reniform, toothed 21. **Ricinodendron**

Leaves simple, sometimes deeply lobed but not into separate leaflets :
Petals present in the male flowers :
Anthers inflexed in bud ; calyx-lobes valvate ; male petals free ; leaves often lepidote or stellate-pubescent below ; flowers spicate or racemose .. .. 22. **Croton**
Anthers erect in bud :
Male calyx-lobes imbricate :
Flowers in axillary fascicles or the females solitary ; small shrubs with narrow leaves ; filaments partially connate ; fruit a small capsule .. 23. **Cluytia**
Flowers cymose or paniculate :
Inflorescence bisexual ; male petals free or united into a tube ; stamens 8, filaments partially connate ; shrubs or herbs with entire or digitately lobed leaves 24. **Jatropha**
Inflorescence unisexual ; male petals free, imbricate ; stamens 10–20, on a hairy receptacle ; fruit a trilobed capsule .. .. 25. **Mildbraedia**

Male calyx-lobes valvate :
Inflorescence racemose or spicate :
Male petals free ; calyx not lepidote :
Dioecious trees ; stipules leaving an annular scar ; male flowers several to each bract, female solitary ; stamens 5–20, free or nearly so
26. **Pseudagrostistachys**
Monoecious herbs ; filaments connate into a column :
Rudimentary ovary present in the male flowers ; styles lacerate ; flowers in lax axillary racemes ; capsule covered with processes .. .. 27. **Caperonia**
Rudimentary ovary 0 ; style 2-fid ; flowers in rather dense racemes from the axils of the upper leaves ; capsule covered with stellate hairs or scales
28. **Chrozophora**
Male petals usually united ; racemes axillary ; calyx lepidote, lobes valvate ; rudimentary ovary 0 ; stamens 8–15 ; capsule lepidote or pubescent
29. **Crotonogyne**
Inflorescence paniculate or cymose ; rudimentary ovary 0 :
Leaves and calyx lepidote ; male petals free ; stamens about 30, free ; leaves 2-glandular at the base .. .. 30. **Cyrtogonone**
Leaves and calyx stellate-pubescent ; male petals united ; stamens 8–15, free ; leaves 2-glandular at the base .. .. .. 31. **Manniophyton**

Petals absent from the male flowers :
* Male calyx closed in bud and enveloping the stamens :
Styles free, or if connate into a column then continuous with the central axis :
Racemes or spikes terminal, simple ; flowers monoecious ; calyx often coloured, lobes imbricate or contorted ; stamens 10, free .. .. 32. **Manihot**
Racemes, spikes or glomerules axillary or lateral :
Male calyx-lobes valvate or subvalvate :
Filaments unbranched, usually free :
Anther-cells separate, except at the point of attachment to the filament, globose or ovoid ; leaves not lobed :
Anther-cells sessile, erect :
Anthers 4-celled ; flowers dioecious, the males in catkin-like spikes ; stamens 3 ; trees or shrubs with alternate or opposite leaves 33. **Tetrorchidium**
Anthers 2-celled :
Buds perulate ; flowers in racemes or glomerules ; pedicels capillary, jointed near the base ; stamens 2–60, free ; capsule usually 2-lobed
34. **Erythrococca**
Buds not perulate :
Flowers regularly distributed along the rhachis of the spikes or racemes ; fruits 2-lobed ; stamens 6–12, free ; trees or shrubs 35. **Claoxylon**
Flowers in distant glomerules or spikelets on a filiform rhachis ; stamens 3–20, free ; fruits 3- or rarely 2-lobed ; annual herbs 36. **Micrococca**
Anther-cells stipitate, at length flexuous ; anthers 2-celled :
Stamens 8 or fewer ; flowers monoecious or rarely dioecious ; female flowers within a variously toothed or lobed, sometimes foliaceous, bract
37. **Acalypha**
Stamens 10 or more ; flowers monoecious or dioecious ; bracts small
38. **Mareya**
Anther-cells adnate to the connective from the middle upwards or throughout, usually oblong :
Anthers 2-celled :
Stamens connate in the lower part, usually 8 ; male spikes on the old wood, bracts large ; shrubs .. .. 39. **Lepidoturus**
Stamens free, 8 or fewer ; bracts small ; trees or shrubs ; male flowers small, clustered on a slender rhachis .. .. .. 40. **Alchornea**
Stamens free, 12 or more :
Styles 2-partite ; leaves palminerved, glandular and stellate-pubescent below ; stamens 15–30, free .. .. .. 41. **Neoboutonia**
Styles 2-partite ; leaves penninerved, 2-glandular at the base ; stamens numerous, free .. .. 42. **Necepsia**
Style simple :
Stamens mixed with receptacular glands :
Hypogynous disk distinct ; stamens 12–15, free ; leaves glabrous ; flowers dioecious .. .. 43. **Crotonogynopsis**
Hypogynous disk 0 ; stamens numerous, free ; leaves hairy below ; flowers monoecious .. .. 44. **Argomuellera**
Stamens without receptacular glands, numerous, free ; leaves gland-dotted or not beneath .. .. 45. **Mallotus**

Anthers 4-celled, rarely 3-celled :
Style bifid ; anther-cells superposed ; stamens numerous, free ; capsule 2–3-coccous .. .. 46. **Cleidion**
Styles simple ; anthers with collateral cells :
Disk present ; stamens about 7, free .. .. .. 47. **Discoglypremna**
Disk absent ; stamens usually numerous, free or united 48. **Macaranga**
Filaments repeatedly branched, columnar below ; anthers 2-celled ; male calyx closed in bud ; lobes valvate ; leaves peltate, palmately lobed ; capsule smooth or echinate .. .. 49. **Ricinus**
Styles connate into a stout column and continuous with the body of the carpels :
Flowers racemose or spicate :
Ovary 4-celled, stamens 8–40, free, mixed with interstaminal glands ; racemes axillary or leaf-opposed .. .. 50. **Tetracarpidium**
Ovary 3-celled :
Stamens numerous, free ; female flower at the top of the inflorescence ; racemes axillary .. .. 51. **Pycnocoma**
Stamens 3, free ; female flowers at the base ; stems often twining, often clothed with stinging bristles .. .. 52. **Tragia**
Flowers in dense involucrate heads ; stamens 20–30, connate below ; stems usually twining .. .. 53. **Dalechampia**
* Male calyx open in bud, not covering the stamens :
Flowers racemose ; stamens 15–21 ; leaves with pulvinate petioles ; fruit indehiscent, 1-celled, transversely oblong .. .. 54. **Plagiostyles**
Flowers spicate ; stamens 2–3 ; fruit dehiscent :
Stamens free ; spikes slender :
Seeds strophiolate .. .. 55. **Sebastiania**
Seeds not strophiolate .. .. 56. **Sapium**
Stamens monadelphous ; male flowers in densely ovoid or subglobose spikes 57. **Maprounea**

Tribe IV.—EUPHORBIEAE

Ovary (female flower) with a cup-like calyx at its base, half surrounded by 4 involucres formed of free bracts, containing the stamens ; male flowers usually about 8 in each involucre, each consisting of a single stamen with a cup-like perianth at its base, jointed to the pedicel ; fruit 3-lobed ; trees .. .. .. 58. **Anthostema**
Ovary (female flower) enclosed in the same involucre as the stamens or in a separate involucre, the latter cupular or 4-angled, more or less lobed and often bearing variously shaped glands on the margin :
Involucre 4-angled, divided into 4 compartments by 4 large partition-like glands, without glands on the margin ; small tree with milky juice .. 59. **Dichostemma**
Involucre not 4-angled, with 2–8 distinct and often very conspicuous glands on the margin :
Fruit a capsule ; trees, shrubs, fleshy plants or small herbs .. 60. **Euphorbia**
Fruit indehiscent, drupaceous, thick and fleshy ; tree with succulent angular branches 61. **Elaeophorbia**

1. OLDFIELDIA Benth. & Hook. f.—F.T.A. 6, 1 : 625.

Leaves opposite, digitately 5–8-foliolate ; leaflets oblanceolate or oblong-elliptic, more or less acuminate, very acute at the base, up to 17 cm. long and 6 cm. broad, glabrous ; male flowers in axillary cymes ; calyx pubescent ; capsule depressed-globose, 2·5 cm. diam., woody .. .. *africana*

O. africana *Benth. & Hook. f.*—F.T.A. 6, 1 : 625 ; Holl. 4 : 580 ; Chev. Bot. 561. A tall forest tree, up to 100 ft. or more in height, with straight bole of 50 ft. and girth 16 ft. ; bark scaly, flaking ; young branchlets rusty-puberulous ; fruit hard, brown, nut-like, with 3 seeds.
Sierra Leone : Rotumba Island ! Bagroo River ! Samu River ! Liberia : Gola Forest. Ivory Coast : Malamalasso, Lower Comoe ; Aboisso ; between Middle Sassandra and Middle Cavally. Exsicc.—*Kirk* 24. *T. Vogel. Oldfield. Mann. Unwin & Smythe* 19. (See Appendix).

2. BRIDELIA Willd.—F.T.A. 6, 1 : 611.

Fruits 2-celled, subglobose, black, about 8 mm. diam. ; branchlets pubescent ; leaves oblong or oblanceolate, rounded at the apex, 5–11 cm. long, 2·5–5 cm. broad, slightly pubescent on the nerves below, very closely and strongly reticulate below, the lateral nerves continued to the margin .. .. 1. *scleroneura*
Fruits 1-celled :
Lateral nerves not continued to the margin to form a marginal nerve ; branchlets flexuous, slightly pubescent ; leaves oblong-elliptic, acuminate, 8–16 cm. long, 4–6·5 cm. broad, glabrescent on both surfaces, not prominently reticulate ; fruits oblong-ellipsoid, about 6 mm. long, black .. .. 2. *atroviridis*

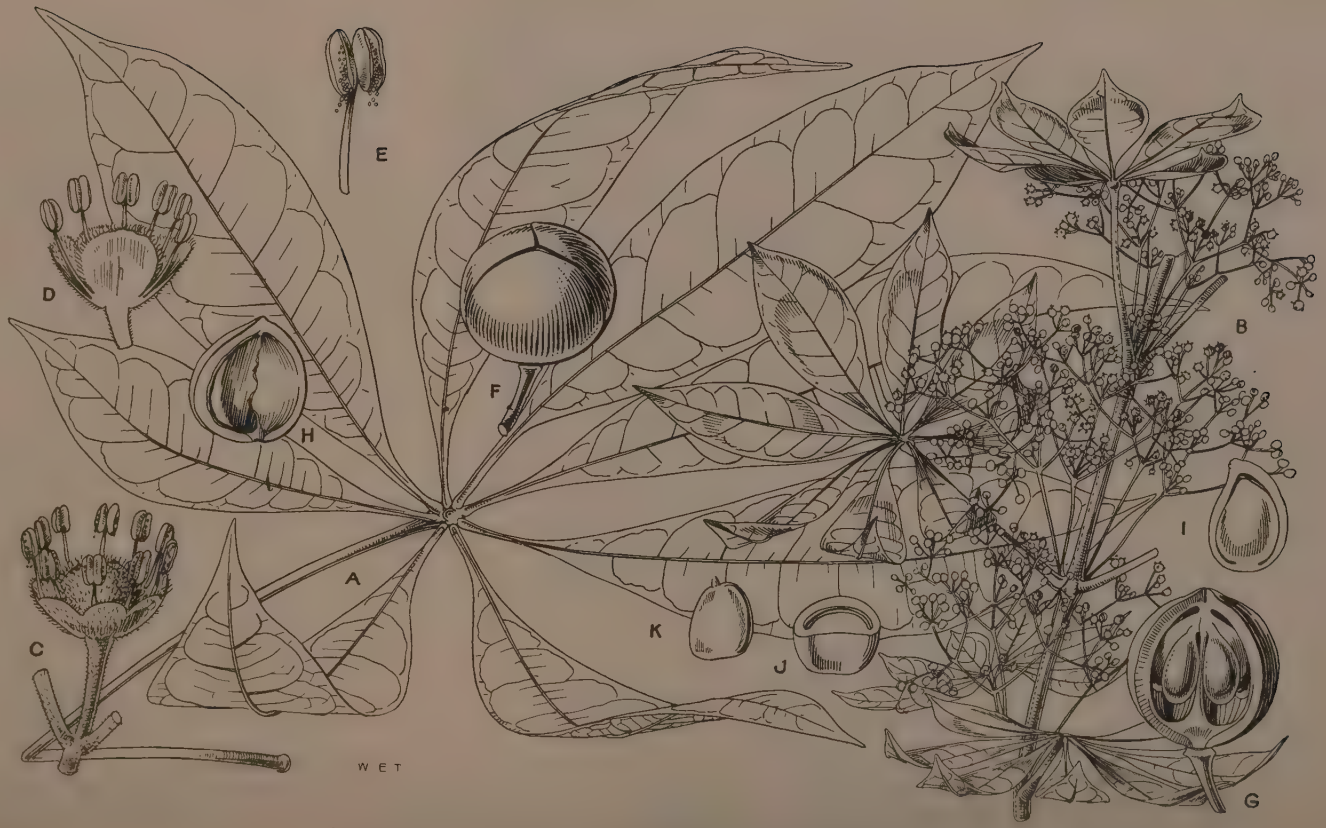

FIG. 115.—OLDFIELDIA AFRICANA *Benth. & Hook. f.* (EUPHORBIACEAE).

A, leaf. B, male inflorescence. C, male flower with rudimentary ovary. D, cross section of same. E, stamen. F, fruit. G, fruit with portion of wall removed. H, same with seeds removed. I, longitudinal section of seed. J, cross section of seed. K, embryo.

Lateral nerves continued to the margin and forming a marginal nerve :
Acumen of the leaves conspicuously mucronate ; leaves glabrous on both surfaces ; veins inconspicuous on the lower surface ; blade rather long-acuminate, oblong-elliptic, 7–14 cm. long, 4–6·5 cm. broad ; branchlets glabrous .. 3. *speciosa*
Acumen of the leaves not or only slightly mucronate ; leaves rusty-pubescent below ; veins prominent on the lower surface ; blade broadly elliptic, 5–10 cm. long, 1·5–6 cm. broad ; branchlets rusty-pubescent.. .. .. .. 4. *ferruginea*
Acumen of the leaves not or only very slightly mucronate ; leaves glabrous or minutely puberulous below ; veins not prominent below ; blade elliptic to obovate, shortly acuminate, 5–17 cm. long, 2·5–7·5 cm. broad ; branchlets soon becoming glabrous or nearly so .. .. 5. *micrantha*

1. **Bridelia scleroneura** *Muell. Arg.*—F.T.A. 6, 1 : 614 ; Holl. 4 : 580 ; Chev. Bot. 554. A shrub or tree up to 40 ft. ; flowers in small axillary clusters red in bud ; common in savannah.
French Guinea : Gourma ! Futa Jallon, between Irébéléya and Timbo. N. Nigeria : Nupe ! Lokoja (Oct.) ! Abinsi (Oct.) ! Yola (fl. and fr. July) ! Sokoto (May) ! S. Nigeria : Onitsha ! Also in French Cameroons. Exsicc.—*Barter* 577 ; 908. *Dalz.* 162 ; 162a ; 784. *Chev.* 24515. (See Appendix).
2. **B. atroviridis** *Muell. Arg.*—F.T.A. 6, 1 : 617 ; Holl. 4 : 578 ; Chev. Bot. 553. A shrub or small tree, about 10 ft. high, or sometimes a large tree ; like the last.
Gold Coast : Tinte Hills, Wioso, in deciduous forest (Dec.) ! Aberem, Birrim (fr. Nov.) ! Dahomey near Sakété, in forest reserve (fr. Jan.) ! S. Nigeria : between Ibadan and Abeokuta ! Egba (June) !

FIG. 116.—BRIDELIA MICRANTHA *Baill.* (EUPHORBIACEAE).

A, male shoot. B, female shoot. C, flower-bud. D, male flower. E, anther. F, female flower. G, longitudinal section of female flower. H, cross section of ovary. I, fruit.

Benin (fl. and fr. Sept., fr. Jan.) ! Ogwashi (fr. Nov.) ! Idumuye (fr. Jan.) ! Also in French Cameroons, Spanish Guinea, and extends to Angola and Rhodesia. Exsicc.—*Farmar* 430. *Dennett* 14 ; 43. *Foster* 189. *Chipp* 784. *Schlechter* 12356. (See Appendix).
3. **B. speciosa** *Muell. Arg.*—F.T.A. 6, 1 : 618. A shrub or a tree 25–30 ft. high, sometimes spiny.
Cameroons Mt. : 4,500 ft. (Feb.) ! Also in Ubangi. Exsicc.—*Mann* 1215.
4. **B. ferruginea** *Benth.*—F.T.A. 6, 1 : 619 ; Holl. 4 : 578 ; Chev. Bot. 553–4. A shrub or small tree up to about 15 ft. high ; fruit ovoid, black, about ½ in. long.
A common shrub of the savannah or on open spaces in the coastal districts ; extending to Nile Land and Uganda, Congo and Angola. Exsicc.—*E. Vogel* 62. *Barter* 1685 ; 1686 ; 1711. *Rowland. Millen* 104. *Dawodu* 26. *Elliott* 6. *Pobéguin* 684. *Warnecke* 157. (See Appendix).
5. **B. micrantha** *Baill.*—F.T.A. 6, 1 : 620 ; Holl. 4 : 579 ; Chev. Bot. 554. *B. speciosa* A. Chev. Bot. 555 (incl. vars.), not of Muell. Arg. *B. mollis* A. Chev. Bot. 554, not of Hutch. *B. tenuifolia* A. Chev. Bot. 555, not of Muell. Arg. A tree up to 20–40 ft. or more high, with a dense widely spreading head ; branches occasionally spiny.
Common in savannah forests, on farms, etc., from Senegal to Cameroons, mostly in the southern regions. Also in Princes and St. Thomas Islands, Spanish Guinea, Congo, Angola, Uganda and East Africa. Exsicc. —*Heudelot* 38 ; 605. *Sieber. Barter* 173. *Mann* 883. *Sc. Elliot* 4018 ; 4583 ; 4911 ; 5216 ; 5397. *Thomson* 85. *Rowland. Brown* 931. *Johnson* 657. *Talb.* 3790. *Pobéguin* 683. *Krause. Deistel* 615. *Caille in Hb. Chev.* 18223. *Chev.* 13465. (See Appendix).

3. CLEISTANTHUS Hook. f.—F.T.A. 6, 1 : 621.

Bracts densely pubescent, subpersistent, 3–5 mm. long ; leaves oblong-lanceolate or oblong-elliptic, subcaudate-acuminate, 5–8 cm. long, 1·3–4 cm. broad, acumen 0·5–1·2 cm. long ; ovary densely rusty-tomentose .. .. .. 1. *polystachyus*

Bracts glabrescent, deciduous, 2 mm. long; leaves oblong or elliptic-oblong, 6–9 cm. long, 2·5–4 cm. broad, acumen 1·5–2 cm. long .. .. .. 2. *libericus*

1. **C. polystachyus** *Hook. f.*—F.T.A. 6, 1 : 624. A shrub or small tree with rusty-pubescent branchlets and coriaceous leaves; flowers in short axillary rusty racemes; fruit subglobose, slightly wrinkled.
Sierra Leone: ? locality! Limba, Madina (Apr.)! Falaba (Apr.)! Laoma (Apr.)! Also in French Cameroons, Spanish Guinea, Angola, Uganda and Nyasaland. Exsicc.—*Sc. Elliot* 5597. *Whitfield. Aylmer* 54; 589.
2. **C. libericus** *N. E. Br.*—F.T.A. 6, 1 : 624; Stapf 648; Chev. Bot. 555. A shrub or small tree, up to 36 ft., with grey glabrescent branchlets and coriaceous leaves; flowers fascicled in small rusty racemes.
Ivory Coast: near Guidéko! Liberia: Sino Basin! Exsicc.—*Whyte. Chev.* 19023.

4. AMANOA Aubl.—F.T.A. 6, 1 : 630.

Flower clusters spicate; leaves oblong-lanceolate, obtusely acuminate, deltoid at the base, 9–16 cm. long, 3–5 cm. broad, rigidly coriaceous; lateral nerves 8–10 pairs, slightly raised below; capsule subglobose, about 2·5 cm. long; seeds shining 1. *bracteosa*

Flower clusters solitary; leaves oblanceolate or oblong-elliptic, 8–18 cm. long, 2·5–4 cm. broad, coriaceous; lateral nerves 8–12 pairs, conspicuous below; immature capsule ovoid .. .. 2. *strobilacea*

1. **A. bracteosa** *Planch.*—F.T.A. 6, 1 : 631; Stapf 648. A glabrous tree, up to 60 ft. high and 5 ft. diam., with stiff bracteate flower-spikes and hard-shelled fruit.
Sierra Leone: near Freetown! Kambui Reserve (May, fr. Jan.). Liberia: Monrovia! Sino Basin! Exsicc.—*Don. Whyte. Lane-Poole* 248. (See Appendix).
2. **A. strobilacea** *Muell. Arg.*—F.T.A. 6, 1: 631; Stapf 648. A glabrous tree, 30 ft. high, with flowers in small bracteate sessile subglobose heads.
Liberia: Sino Basin! S. Nigeria: Cameroons River (Jan.)! Exsicc.—*Mann.* 745; 2220. *Whyte.*

5. SPONDIANTHUS Engl. Bot. Jahrb. 36 : 215 (1905).—F.T.A. 6, 1 : 627 (as *Megabaria*) and p. 1044.

Inflorescence pubescent, paniculate, terminal; leaves obovate or elliptic, obtuse, 9–18 cm. long, 4–11 cm. broad, glabrous, on petioles of very unequal length; lateral nerves 6–8 pairs; petiole up to 8 cm. long, wrinkled at the apex; capsule subsessile or shortly pedicellate, ellipsoid, horny, 2 cm. long, 1·5 cm. broad; seeds ellipsoid, 1 cm. long, red, shining .. .. 1. *Preussii*

Inflorescence glabrous; leaves more or less as above, but with 6–14 lateral nerves; fruits ellipsoid, angular, 2·5 cm. long, red-brown, slightly pointed at the ends 2. *ugandensis*

1. **S. Preussii** *Engl.*—F.T.A. 6, 1 : 1044. *Megabaria Trillesii* Pierre.—F.T.A. 6, 1 : 627. A tree 30–45 ft. high with glabrous branchlets; male inflorescence 3–4 or more inches long.
S. Nigeria: Barombi! Victoria! Also in French Cameroons, Spanish Guinea, Congo, Angola.
2. **S. ugandensis** *Hutch.*—F.T.A. 6, 1 : 1044. *S. Preussii* var. *glabra* Engl. *Megabaria ugandensis* Hutch.—F.T.A. 6, 1 : 628; Chev Bot. 586. A forest tree like the preceding, 50 ft. or more high, with scaly bark; leaves sometimes copper-coloured; male inflorescence 6–8 in. long.
French Guinea: Farana (Jan.)! Sahadou, at the sources of Sassandra R.! Sierra Leone: Dantilia, on laterite plateau (fr. Mar.)! Ivory Coast: Agboville (Nov.)! Dabou; Bouroukrou; Indénié! Gold Coast: Tano Rapids! Extends to Ubangi-Shari, Eastern Sudan and Uganda. Exsicc.—*Sc. Elliot* 5390. *Chipp* 377. *Chev.* 16214; 16634; 20495; 20873; 22381b; 22635. (See Appendix).

6. MARTRETIA Beille—F.T.A. 6, 1 : 655.

Leaves lanceolate to ovate-elliptic, gradually acuminate, shortly cuneate at the base, 10–22 cm. long, 3–9 cm. broad, glabrous, with 10–15 pairs of nerves slightly prominent on both surfaces; flowers dioecious; male racemes axillary, 5 cm. long; sepals 4; stamens 5–7; female sepals 5 or 6; ovary 2-lobed, each lobe slightly bifid; styles linear, undivided .. .. *quadricornis*

M. quadricornis *Beille*—F.T.A. 6, 1 : 655; Chev. Bot. 585. A tree with glabrous branchlets.
Sierra Leone: Mano! Ivory Coast: Dabou in swamp forest (Feb.). Bingerville (Feb.). Fort Binger (Feb.)! Also in the Upper Ubangi region. Exsicc.—*Thomas* 9913. *Chev.* 16215; 17360; 19529.

7. APODISCUS Hutch.—F.T.A. 6, 1 : 1045.

A tree; branchlets glabrous; leaves oblong-elliptic, acuminate, subcuneate at the base, 8–17 cm. long, 3–8 cm. broad, entire, leathery, glabrous; lateral nerves 8–14 pairs with intermediate ones less conspicuous; spikes bisexual, with 1–2 shortly pedicellate females towards the base; axis tomentose; male sepals tomentellous; stamens 5; ovary 4-celled, pubescent .. .. *Chevalieri*

A. Chevalieri *Hutch.*—F.T.A. 6, 1 : 1046; Chev. Bot. 586. A tree 25–30 ft. high.
French Guinea: Kouria and environs, in a marsh (Nov.)! between Santa R. and Timbo. Exsicc.—*Caille in Herb. Chev.* 14997; 15057.

8. PROTOMEGABARIA Hutch.—F.T.A. 6, 1 : 656.

Leaves pubescent on the midrib and lateral nerves below; rudimentary ovary bipartite; leaf-blade elongate-oblong or obovate, rounded or shortly acuminate, 15–37 cm. long,

8–15 cm. broad, thinly papery ; lateral nerves 10–17 pairs ; male racemes about 7 cm. long, slender ; capsule subglobose or oblong-ellipsoid, 3–4 cm. diam. 1. *Stapfiana*

Leaves glabrous on the midrib and lateral nerves ; rudimentary ovary undivided ; otherwise more or less as above, but male racemes 10–13 cm. long 2. *macrophylla*

1. **P. Stapfiana** *Hutch.*—F.T.A. 6, 1 : 656 ; Chev. Bot. 586. *Spondianthus obovatus* Engl. A tree about 50 ft. high, with stout glabrous branchlets and buttressed stem.
Sierra Leone : Falaba-Pujehun (Mar.) ! Ivory Coast ; Lower Comoé, Malamalasso (Mar.) ! Sanvi (Mar.). Gold Coast : Kankan, E. Akim (Mar.) ! Kwahu ! Western Province, Bawdia (Apr.) ! S. Nigeria : Oban ! Also in Gabon. Exsicc.—*Johnson* 596. *Thompson* 92. *Talb.* 2325 ; 2326. *Vigne* 156 ; 954. (See Appendix).
2. **P. macrophylla** *Hutch.*—F.T.A. 6, 1 : 657. A small tree about 20 ft. high, like the preceding.
S. Nigeria : Oban ! Also in French Cameroons and Gabon. Exsicc.—*Talb.* (no number).

9. THECACORIS A. Juss.—F.T.A. 6, 1 : 658.

Leaves oblanceolate-obovate, narrowed to the acute base from above the middle, gradually acuminate, 6–12 cm. long, 2–6 cm. broad, setulose below on the midrib and lateral nerves ; lateral nerves 6–8 pairs ; male racemes 3 cm. long, pubescent ; Sierra Leone and Ivory Coast .. .. 1. *Chevalieri*

Leaves elliptic to obovate, rounded or shortly cuneate at the base, usually over 12 cm. long ; racemes longer than above :

Leaves cuneate at the base :

Male inflorescences densely pubescent, 5 cm. long, females stout ; leaves abruptly acuminate, very shortly cuneate at the base, 10–16 cm. long, 4–8 cm. broad ; lateral nerves 6–7 pairs .. .. 2. *stenopetala*

Male inflorescences slightly pubescent, very slender, about 15 cm. long ; leaves gradually acuminate, fairly long-cuneate at the base, about 20 cm. long and up to 10 cm. broad ; lateral nerves 9–10 pairs .. .. 3. *obanensis*

Leaves rounded at the base, broadly elliptic, shortly acuminate, 15–25 cm. long, 8–11 cm. broad, glabrous and shining ; lateral nerves 9–10 pairs ; male inflorescences about 5 cm. long, slightly pubescent .. .. 4. *Talbotae*

1. **Thecacoris Chevalieri** *Beille*—F.T.A. 6, 1 : 660 ; Chev. Bot. 567. A shrub 6–10 ft. high ; young branchlets rusty-hairy ; fruit 3-lobed, ¼ in. diam., sparingly setulose.
Sierra Leone : Bagroo R. ! Roruk (Nov.) ! Ivory Coast : Lower Comoé, Malamalasso (Mar.). Alépé (Feb.–Mar.) ; Middle Cavally, R. Hana. Exsicc.—*Mann* 833. *Thomas* 5783.
2. **T. stenopetala** *Muell. Arg.*—F.T.A. 6, 1 : 659. A shrub with glabrescent branchlets ; fruit like the preceding but glabrous.
Fernando Po (fr. Nov.) ! Also in Princes Isl. and St. Thomas. Exsicc.—*T. Vogel* 228.
3. **T. obanensis** *Hutch.* in Kew Bull. 1928 : ined. A shrub or small tree ; branchlets shortly pubescent at first.
S. Nigeria : Oban ! Exsicc.—*Talb.* (no number).
4. **T. Talbotae** *Hutch.* in Kew Bull. 1928 : ined. A shrub or small tree, rusty golden-pubescent on the young parts.
Ivory Coast : between Fort Binger and Mt. Niénokué (July) ! S. Nigeria : Oban ! Exsicc.—*Talb. Chev.* 19502 bis.

10. MAESOBOTRYA Benth.—F.T.A. 6, 1 : 663.

Stipules foliaceous, falcate, 1·5 cm. long, persistent ; leaves elliptic or oblong-elliptic, caudate-acuminate, rounded at the base, 9–20 cm. long, 4–10 cm. broad, obscurely denticulate, setulose on the midrib and nerves below ; male and female inflorescences in dense clusters on the older wood, the former about 6 cm. long, the latter 15 cm. long 1. *Dusenii*

Stipules not foliaceous, very small :

Leaves elongate-oblong, entire, abruptly triangular-acuminate, slightly rounded at the base, 6–14 cm. long, 2·5–4·5 cm. broad, glabrous on both surfaces ; lateral nerves 8–10 pairs ; female racemes axillary, nearly as long as the leaves ; ovary slightly setulose .. .. 2. *oblonga*

Leaves more or less broadly elliptic or obovate :

Ovary glabrous ; inflorescences on the young shoots or just below them ; leaves elliptic, acutely acuminate, rounded at the base or rarely slightly cuneate, 8–20 cm. long, 3–9 cm. broad, denticulate, sparingly setulose on the nerves below 3. *sparsiflora*

Ovary glabrous ; inflorescence on the old wood, males not known ; axis nearly glabrous ; leaves elliptic, abruptly acuminate, rounded at the base, glabrous below, 10–22 cm. long, 5–10 cm. broad, undulate or subentire .. .. .. 4. *edulis*

Ovary densely pilose ; inflorescences usually clustered on the old wood or towards the base of the leafy shoots ; leaves elliptic to obovate, acutely cuspidate-acuminate, rounded at the base, up to 23 cm. long and 11 cm. broad, repand-denticulate, sparingly pubescent below .. .. 5. *Barteri*

1. **Maesobotrya Dusenii** *Hutch.*—F.T.A. 6, 1 : 664. A tree or shrub ; branchlets pilose and somewhat angular ; fruit obovoid, about ½ in. long, glabrous, usually 1-seeded.
S. Nigeria : Oban ! Eket ! Also in French Cameroons, Spanish Guinea and Gabon. Exsicc.—*Talb.* 11 ; 16 ; 609 ; 1581.
2. **M. oblonga** *Hutch.*—F.T.A. 6, 1 : 668. A shrub ; branchlets terete, pubescent when young.
Liberia : Kakatown ! Exsicc.—*Whyte.*

3. **M. sparsiflora** *Hutch.*—F.T.A. 6, 1 : 665 ; Chev. Bot. 565. A climbing shrub or small tree up to 20–30 ft. ; branchlets pubescent when young ; male racemes solitary or 2–3 together, reddish, 1–3 in. long ; fruits ellipsoid, ⅜ in. long, covered with a glaucous bloom.
French Guinea, Sierra Leone and Ivory Coast : various localities ! Gold Coast : Aburi (Aug.) ! Exsicc. —*Sc. Elliot* 4035 ; 4543 ; 4746 ; 5311 ; 5813. *Johnson* 1067. *Lane-Poole* 175. (See Appendix).
4. **M. edulis** *Hutch. & J. M. Dalz.* in Kew Bull. 1928. Ined. *Baccaurea edulis* A. Chev. Bot. 563. *M. cauliflora* Hutch. ex Chipp List Gold Coast Trees, etc., 34, name only. A small tree, 12 ft. ; young branchlets yellow-brown pubescent ; racemes clustered on thickened cushions of the old wood, reddish, 2–2½ in. long ; fruit red, about the size of a cherry.
Ivory Coast : Agniéby Valley (Mar.) ! Gold Coast : Tanosu (Feb.) ! N. Beyin (July) ! Exsicc.—*Brent* 7DD. *Chipp* 264 ; 348. (See Appendix).
5. **M. Barteri** *Hutch.*—F.T.A. 6, 1 : 669. A shrub or small tree, up to 25 ft. high, occasionally scrambling in forest ; young branchlets yellow-brown pubescent ; racemes creamy, 1–2½ in. long ; fruits ellipsoid, ½ in. long, slightly pubescent, succulent, black-purple when ripe ; seeds bright red.
S. Nigeria : Lagos Colony, several localities ! Ikoyi (June) ! Yaba (Apr.) ! Oban ! Calabar (Feb.) ! Also in French Cameroons and Spanish Guinea. Exsicc.—*Barter* 3289 ; 3296. *Mann* 2299 ; 2300. *Millen* 32 ; 41 ; 92 ; 153 ; 174 ; 220. *Talb.* 186 ; 1492. (See Appendix).

11. ANTIDESMA Linn.—F.T.A. 6, 1 : 642.

Stipules laciniate, deeply 3–5 partite ; leaves oblong or oblanceolate-elliptic, acuminate, mucronate, rounded at the base, 10–25 cm. long, 4–9 cm. broad, rigidly membranous, glabrous except on the midrib and nerves beneath ; male racemes 5–6·5 cm. long, with a pubescent peduncle .. .. 1. *laciniatum*

Stipules entire :

Fruits sessile ; leaves oblanceolate or oblong-oblanceolate, cuspidate-acuminate, acute at the base, 10–15 cm. long, 2·5–5 cm. broad, pubescent on the midrib ; petiole wrinkled subglabrous .. .. 2. *Vogelianum*

Fruits pedicellate :

Leaves rather large, obovate to elliptic-oblanceolate, usually caudate-acuminate, cuneate at the base, glabrous excepting the midrib and lateral nerves ; petiole densely pubescent at first ; male inflorescence pubescent, 5–12 cm. long 3. *membranaceum*

Leaves rather small, elliptic or oblong-elliptic, mostly rounded at base and apex, rarely shortly and obtusely pointed, often hairy and sometimes quite tomentose below ; petiole tomentose ; male spike tomentose, up to 15 cm. long 4. *venosum*

1. **Antidesma laciniatum** *Muell. Arg.*—F.T.A. 6, 1 : 643 ; Chev. Bot. 564. A tree, up to 30 ft. or more high ; fruit ellipsoid, about ¼ in. long, glabrous, red when ripe.
Ivory Coast : Bouroukrou ; foot of Mt. Nouba at sources of R. Nuon. S. Nigeria : Lagos Colony ! Benin (July) ! Oban ! Victoria (Apr.) ! Fernando Po (Jan., June) ! Also in French Cameroons, Spanish Guinea and Congo. Exsicc.—*Barter* (no number). *Mann* 201 ; 256. *Rowland. Unwin* 113. *Schlechter* 12363. (See Appendix).
Var. **membranaceum** Muell. Arg.—Branchlets with nerves and veins on the lower surface of the leaves clothed with long spreading hairs ; lobes of the stipules subulate, longer than in the type.
French Guinea : between Loia and Nzo (Mar.) ! Macenta (May) ! Sierra Leone : several localities (Feb., Apr., May) ! Liberia : Peahtah (Oct.) ! Ivory Coast : Sanvi ; Aboisso. Gold Coast : Kwahu (Mar.) ! near Axim (Apr.) ! Kumasi ! Exsicc.—*Mann* (no number). *Sc. Elliot* 5007 ; 5607. *Cummins* 97. *Johnson* 637. *Collenette* 8. *Linder* 964.
2. **A. Vogelianum** *Muell. Arg.*—F.T.A. 6, 1 : 645. A shrub ; fruit sessile, elliptic, compressed, pointed at both ends, sparingly appressed-pubescent, ¼ in. long.
S. Nigeria : Abo ! Exsicc.—*T. Vogel* 22.
3. **A. membranaceum** *Muell. Arg.*—F.T.A. 6, 1 : 645 ; Chev. Bot. 564. A tree, 20–30 ft. high ; fruit elliptic, slightly flattened, ⅜ in. long.
Liberia : Gbanga ! Ivory Coast : several localities, in forest ! Togo : Bo Mts. ! Dahomey : Savalou, Pira, in forest. N. Nigeria : Nupe ! S. Nigeria : Calabar (fr. Mar.) ! Eket ! Oban ! Also in French Cameroons, Gabon, Congo and Uganda. Exsicc.—*Barter* 1557. *Holl.* 89. *Talb.* 3072 ; 3114. *Kersting* A. 635. *Linder* 802. (See Appendix).
4. **A. venosum** *Tul.*—F.T.A. 6, 1 : 646 ; Chev. Bot. 565. *A. Staudtii* A. Chev. Bot. 565, not of Pax. A shrub or tree up to 30 ft. ; fruit shortly pedicellate, ellipsoid, slightly flattened, glabrous, ½ in. long.
Common from Gambia and French Guinea to Cameroons ; throughout tropical Africa and also in S. Africa. Exsicc.—*T. Vogel* (no number). *Barter* 1696. *Sc. Elliot* 5259 ; 5393 ; 5708. *Johnson* 634 ; 636. *Elliott* 189. *Poéguin* 246. *Chev.* 21633. (See Appendix).

12. CYATHOGYNE Muell. Arg.—F.T.A. 6, 1 : 653.

A small herb ; leaves obovate-elliptic, shortly acuminate, acute or subacute at the base, 7–11 cm. long, 4–5 cm. broad, coarsely repand-dentate except in the lower third, glabrous or nearly so ; lateral nerves 5–6 pairs ; female racemes 4 cm. long *Preussii*

C. Preussii *Pax*—F.T.A. 6, 1 : 655. Herb about a foot high from a horizontal rhizome.
S. Nigeria : Victoria ! Also in French Cameroons and Belgian Congo. Exsicc.—*Preuss* 1210.

13. HYMENOCARDIA Wall.—F.T.A. 6, 1 : 648.

Axis of the fruit projecting from the middle of an obscure sinus, the wings spreading horizontally :

Fruits glabrous, cordate, broader than long, 2·5–3 cm. broad, reticulate ; leaves elliptic to broadly ovate or rounded, obtuse, cordate at the base, 4–9 cm. long, 3·5–7 cm. broad, papery, midrib and lateral nerves pubescent beneath, densely glandular below ; male spikes 2·5–5 cm. long .. .. .. 1. *Heudelotii*

Fruits pubescent, slightly cordate, otherwise as above ; leaves more or less as in *H. Heudelotii*, but more pubescent .. .. 2. *Chevalieri*

FIG. 117.—HYMENOCARDIA ACIDA *Tul.* (EUPHORBIACEAE).

A, male shoot. B, male flower with rudimentary ovary. C, D, stamen back and front. E, female shoot. F, female flower. G, fruiting branch.

Axis of the fruit not projecting from the middle of the sinus, the wings ascending :
Wings of the cocci almost touching at the top, forming a very narrow sinus ; fruits lyrate, 2–2·5 cm. long, reticulate ; leaves ovate-elliptic, obtusely acuminate, rounded at the base, 2·5–6 cm. long, 1·5 –3 cm. broad, laxly glandular below but not hairy 3. *lyrata*
Wings of the cocci divergent, forming a broad sinus at the top ; fruits obcordate, about 2·5 cm. long, reticulate ; leaves elliptic-oblong, obtuse or rounded at the apex, obtuse at the base, up to 9 cm. long and 4 cm. broad, densely glandular beneath, pubescent when young but usually becoming glabrous .. .. .. 4. *acida*

1. **Hymenocardia Heudelotii** *Muell. Arg.*—F.T.A. 6, 1 : 650 ; Chev. Bot. 567. A shrub or small tree ; young branchlets whitish pubescent.
Senegal : ? locality ! French Guinea : Konkouré, Timbo ; Ditinn (Mar.) ! Sierra Leone : Limba, Madina (Apr.) ! Falaba (Apr.) ! Mussaiya (Mar.) ! Mofari (Jan.) ! Pujehun (fr. Apr.) ! Erimakuna (Mar.) ! N. Nigeria : Lokoja ! Nupe ! S. Nigeria : Idah ! Also in Cameroons, Ubangi and Belgian Congo. Exsicc. -*Heudelot* 838. *Barter* 327 ; 383 ; 1150. *Sc. Elliot* 4431 ; 5104 ; 5257 ; 5899.
2. **H. Chevalieri** *Beille*—F.T.A. 6, 1 : 650 ; Chev. Bot. 567. A shrub or small tree, of savannah forests, 10–20 ft. high ; branchlets densely short-pubescent.
French Guinea : Futa Jallon, Kollangui ; Labé. Sierra Leone : between Berria and Falaba (Feb.) ! Gold Coast : ? locality ! Ivory Coast : Lower Comoé R. Exsicc.—*Sc. Elliot* 4976. *Easmon.*
3. **H. lyrata** *Tul.*—F.T.A. 6, 1 : 651. *H. Beillei* A. Chev. Bot. 567 (name only). A shrub ; branchlets at first sparingly pubescent, soon glabrous.
Senegal : Casamance (fr. Dec.) ! Sierra Leone : ? locality (fr. Dec.) ! Ivory Coast : Middle Cavally, Mt. Niénokué, 1,500 ft. Exsicc.—*Heudelot* 581. *Unwin & Smythe* 10. *Chev.* 19454.
4. **H. acida** *Tul.*—F.T.A. 6, 1 : 651 ; Chev. Bot. 566. A shrub or small tree about 20 ft. high, with red rusty-puberulous branches ; often stunted and gnarled in open country.
Common from Senegal and French Sudan to Cameroons ; throughout tropical Africa, south to Rhodesia. Exsicc.—*Heudelot* 779. *Perrottet* 359. *Leprieur. Barter* 329 ; 1098 ; 1206 ; 1207 ; 1558. *Sc. Elliot* 4886 ; 5075 ; 5449. *Farmar* 230 ; 231 ; 287. (See Appendix).

14. DRYPETES Vahl—F.T.A. 6, 1 : 674 (*Cyclostemon* Blume [1]).

Flowers in the axils of the leaves :
Midrib of the leaves below and branchlets pubescent ; leaves toothed :
Leaves sessile or subsessile, rather long-acuminate :
Leaves more or less ovate, very unequal-sided at the base, acutely caudate-acuminate, closely serrulate, 5–11 cm. long, 2·5–4 cm. broad ; stipules persistent ; fruits ovoid, 2·5 cm. long, densely tomentose .. .. 1. *inaequalis*
Leaves oblong, cordate and very unequal-sided at the base, long and gradually acuminate, 5–11 cm. long, 2·5–5 cm. broad, rather distantly denticulate ; stipules deciduous ; flowers small ; pedicels 5 mm. long, puberulous ; fruits ovoid, 2·5 cm. long, puberulous .. .. 2. *Chevalieri*
Leaves with a petiole up to 1 cm. long, acuminate, slightly unequal at the base, crenate-serrate, 10–16 cm. long, 4–8 cm. broad ; stipules deciduous ; styles 2, spreading .. .. 3. *occidentalis*
Midrib of the leaves below and branchlets glabrous :
Leaves rather small, up to 10 cm. long and 5 cm. broad :
Midrib of the leaves raised above ; stamens 4 ; leaf-blade elliptic or elliptic-lanceolate, shortly acuminate, acutely cuneate at the base, 5–9 cm. long, 2–4 cm. broad, finely reticulate ; male flowers numerous ; pedicels pubescent, 0·5 cm. long 4. *leonensis*
Midrib as above ; stamens 4 ; leaf-blade as above but smaller, 3–6·5 cm. long, 2–4 cm. broad ; pedicels about 2 mm. long, densely pubescent .. 5. *Rowlandii*
Midrib not raised above ; stamens 8 ; leaf-blade elliptic, very shortly acuminate, cuneate at the base, 5–10 cm. long, 2·5–4·5 cm. broad ; pedicels up to 0·5 cm. long, glabrous .. .. 6. *aframensis*
Leaves large, 15 cm. or more long and usually over 5 cm. broad :
Leaves not more than 7·5 cm. broad ; sepals densely pubescent outside, ciliate ; pedicels 0·5 cm. long .. .. 7. *Principum*
Leaves usually over 9 cm. broad :
Flowers subsessile ; sepals puberulous outside ; leaves oblong-elliptic, 15 23 cm. long .. .. 8. *glomerata*
Flowers on pedicels of 5–8 mm. ; sepals glabrous outside ; leaves oblong-elliptic, 30–35 cm. long .. .. 9. *similis*
Flowers in fascicles on the old wood or from the nodes of two-year-old branchlets :
Stipules persistent, linear-lanceolate, acute, pubescent, about 1 cm. long ; leaves elongate-oblong-elliptic, acutely long-caudate-acuminate, up to 27 cm. long and 9 cm. broad, glabrous, with about 8 pairs of very prominent looped lateral nerves ; male pedicels very short ; sepals thinly pubescent .. .. 10. *molunduana*
Stipules early deciduous, very small :
Leaves entire or slightly undulate on the margin :
Leaves abruptly and acutely cuneate at the base, oblong or oblong-elliptic, acutely acuminate, 10–15 cm. long, 5–7 cm. broad, distinctly reticulate on both surfaces ;

[1] *Cyclostemon gabonense* A. Chev. Bot. 561, not of Pierre, is a species of *Enantia* (*Anonaceae*), probably undescribed.

lateral nerves 5–6 pairs ; male flowers with very slender pedicels 1·5 cm. long ; sepals glabrous outside .. .. 11. *Afzelii*

Leaves rounded or obtusely cuneate at the base :

Leaves up to 12 cm. long and 4 cm. broad, elliptic, obtusely acuminate ; lateral nerves 5–6 pairs ; male pedicels 8 mm. long, slender, glabrous ; flower buds depressed-globose, about 3 mm. long, glabrous ; fruits shortly stalked, globose, 2–2·5 cm. diam., shortly pubescent .. .. 12. *ivorensis*

Leaves 18–23 cm. long, 5–6 cm. broad, elongate-oblong, rounded-oblong, rounded at the base, caudate-acuminate ; lateral nerves about 8 pairs, strongly reticulate below ; male pedicels 8 mm. long ; sepals about 4 mm. long ; female flowers not known .. .. 13. *Talbotii*

Leaves distinctly toothed :

Midrib of the leaves pubescent below ; blades oblong-oblanceolate, caudate-acuminate, subcuneate or rounded at the base, 6–15 cm. long, up to 5·5 cm. broad ; male pedicels 1·3 cm. long, glabrous .. .. 14. *Preussii*

Midrib of the leaves glabrous below :

Leaves broadly ovate-elliptic, obtusely and shortly acuminate, rounded and very unequal at the base, 4–8 cm. long, 2–5 cm. broad ; male pedicels 5–8 mm. long, stout, glabrous .. .. 15. *ovata*

Leaves oblong or oblong-lanceolate :

Sepals glabrous except on the margin ; leaves not or scarcely acuminate, subcuneate at the base, 6–11·5 cm. long, 2·5–5 cm. broad ; lateral nerves 5–6 pairs :

Male pedicels about 1 cm. long .. .. 16. *floribunda*

Male pedicels up to 3 mm. long .. .. 17. *obanensis*

Sepals pubescent outside ; leaves more or less acuminate :

Inner sepals rather long-ciliate ; other characters as above .. 7. *Principum*

Inner sepals very slightly ciliolate ; leaves oblong, obtusely acuminate, up to 16 cm. long and 5·5 cm. broad, petiolate, distantly toothed ; male pedicels about 5 mm. long .. .. 18. *Aylmeri*

1. **Drypetes inaequalis** *Hutch.*—F.T.A. 6, 1 : 684. *Cyclostemon leonensis* Pax. *D. leonensis* Pax & K. Hoffm., not of Pax. A shrub ; branchlets angular, with spreading yellowish pubescence.
   Sierra Leone : ? locality ! Ninia, Talla Hills (fr. Feb.) ! Exsicc.—*Afzelius. Sc. Elliot* 4895.
2. **D. Chevalieri** *Beille*, ined. ; Chev. Bot. 560. A shrub 10–15 ft. high ; branchlets slightly pubescent at first ; flowers white ; fruits red.
   Ivory Coast : various localities (Feb.–Apr.) ! S. Nigeria : Oban ! Exsicc.—*Chev.* 21128 ; 21290. *Talb.* 678.
3. **D. occidentalis** *Hutch.*—F.T.A. 6, 1 : 683. A tree about 20 ft. high ; branchlets grooved, densely rusty-tomentellous.
   Fernando Po ! Exsicc.—*Mann* 1158.
4. **D. leonensis** *Pax* (not of *Pax & K. Hoffm.*).—F.T.A. 6, 1 : 682. *D. Hutchinsonii* Pax. *D. kamerunica* Pax & K. Hoffm., partly ? Branchlets terete, slightly pubescent.
   Sierra Leone : Duniya, Talla Hills (Feb.) ! Gold Coast : Asunan Kruma (Mar.) ! Togo. Exsicc.—*Sc. Elliot* 4981. *Vigne* 92. *Mildbraed* 7211 (not seen).
5. **D. Rowlandii** *Pax*—F.T.A. 6, 1 : 681. A shrub with slightly angular branchlets.
   S. Nigeria : Lagos Colony ! Exsicc.—*Rowland.*
6. **D. aframensis** *Hutch* —F.T.A. 6, 1 : 682. A tree 40 ft. high.
   Gold Coast : Afram Plains (Mar.) ! Exsicc.—*Johnson* 714.
7. **D. Principum** *Hutch.*—F.T.A. 6, 1 : 684 ; Chev. Bot. 561 (as *Cyclostemon sp.*). A small tree up to 30 ft. high ; young branchlets grooved, sparingly pubescent, soon glabrous.
   French Guinea : Kouria, Longuéry, in forest undergrowth (Dec.) ! S. Nigeria : Oban ! Also in Princes Island. Exsicc.—*Talb.* 679. *Caille in Herb. Chev.* 14826.
8. **D. glomerata** *Hutch.*—F.T.A. 6, 1 : 679. A shrub about 20 ft. high with glabrous terete branchlets.
   Fernando Po ! Exsicc.—*Mann* 278.
9. **D. similis** *Hutch.*—F.T.A. 6, 1 : 679. A tree like the last ; fruit ellipsoid, ½ in. or more long.
   S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Talb.* 619 ; 1495 ; 1710.
10. **D. molunduana** *Pax & K. Hoffm.* in Engl. Pflanzenr. 4, 147, 15 : 258. *D. stipularis* S. Moore in Cat. Talb. Nig. Pl. 144, not of Hutch. A small tree with deeply grooved pubescent branchlets.
    S. Nigeria : Oban ! Mayuku (Feb.) ! Johann-Albrechtshöhe. Also in French Cameroons. Exsicc.—*Talb.* 1645 ; 2337. *Dalz.* 8239.
11. **D. Afzelii** *Hutch.*—F.T.A. 6, 1 : 685. A tree up to 40 ft. high ; young branchlets grooved, glabrous ; flowers yellow ; fruit oblong-ellipsoid, nearly 1 in. long, brownish-pubescent.
    Sierra Leone : Jerihun (fl. Sept., fr. Jan.) ! ? locality ! Njala (fr. Jan.) ! Liberia : Yeh River (Oct.) ! Exsicc.—*Afzelius. Smythe* 236. *Aylmer* 602. *Dalz.* 8102. *Linder* 990. (See Appendix).
12. **D. ivorensis** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *D. Pierreana* A. Chev. Bot. 561, not of Hutch. A shrub 6–10 ft. high, with greenish-yellow flowers arising from cushions on the trunk ; fruits rough-skinned, red, edible.
    Ivory Coast : Bouroukrou (Dec.) ! Between the Middle Sassandra and Middle Cavally ! in undergrowth in the forest (July) ! Yabas country, Tébo village (July) ! Exsicc.—*Chev.* 16694 ; 19227 ; 19416. (See Appendix).
13. **D. Talbotii** *S. Moore* in Talb. Cat. Nig. Pl. 97. A tree.
    S. Nigeria : Oban ! Exsicc.—*Talb.* 8 ; 2337.
14. **D. Preussii** *Hutch.*—F.T.A. 6, 1 : 686. A tree 12–20 ft. high ; young branchlets densely hairy.
    S. Nigeria : Barombi ! Also in French Cameroons. Exsicc.—*Preuss* 23.
15. **D. ovata** *Hutch.*—F.T.A. 6, 1 : 688. An evergreen shrub or small tree with dense foliage ; bark breaking up longitudinally ; fruits globose, the size of a cherry.
    Togo : near Lome ! Exsicc.—*Warnecke* 154. (See Appendix).
16. **D. floribunda** *Hutch.*—F.T.A. 6, 1 : 687 ; Chev. Bot. 561 (as *Cyclostemon floribundus* Muell. Arg.). A small tree with slender slightly pubescent branchlets and distantly serrate leaves.
    Gold Coast : Accra plains ! S. Nigeria : Idah ! Lagos (May) ! Abeokuta ; Olokemeji. Oban ! Exsicc.—*Barter* 1673. *Foster* 80. *Irvine* 651. *Talb.* 677 ; 2310.
17. **D. obanensis** *S. Moore* in Talb. Cat. Nig. Pl. 97. A small tree with pubescent branchlets and crenate leaves ; flowers small, colourless.
    S. Nigeria : Oban ! Exsicc.—*Talb* 677 ; 2310.

18. **D. Aylmeri** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A small tree with glabrous slightly grooved branchlets.
Sierra Leone: Jerihun (Sept.) ! Exsicc.—*Aylmer* 603.

15. LINGELSHEIMIA Pax—F.T.A. 6, 1 : 690.

One half of the leaf-blade produced below the other at the base ; leaves ovate-elliptic, caudate-acuminate, acumen about 1·3 cm. long, rounded at the base, 5–9 cm. long, 2·5–4 cm. broad, papery, glabrous ; male pedicels 4–8 mm. long .. 1. *Gilgiana*

One half of the leaf-blade not produced below the other at the base ; leaves ovate or ovate-lanceolate, subacutely acuminate, rounded at the base, 4–9 cm. long, 1·3–4 cm. broad, serrate, glabrous ; male pedicels 2 mm. long .. .. 2. *parvifolia*

1. **L. Gilgiana** *Hutch.*—F.T.A. 6, 1 : 691 ; Chev. Bot. 587. *Drypetes Gilgiana* Pax & K. Hoffm. A shrub or small tree about 15 ft. high ; branchlets grooved, slightly pubescent, becoming glabrous ; with membranous subsessile leaves ; flowers dull yellow ; fruit ½–¾ in. diam., bright red.
Liberia : Banga ! Peahtah ! Yeh River (Oct.) ! Ivory Coast : several localities ! Gold Coast : Jomura, Tano R. (fr. Jan.) ! Dahomey : between Kétou and Lake Azri ! S. Nigeria : Lagos Colony (Sept., Oct.) ! Also in French Cameroons. Exsicc.—*Millson* 139. *Foster* 353. *Brent* 6DD. *Linder* 992 ; 1075 ; 1238. (See Appendix).
2. **L. parvifolia** *Hutch.*—F.T.A. 6, 1 : 692. *Drypetes parvifolia* Pax & K. Hoffm. A small shrub with glabrous terete branchlets.
Sierra Leone : ? locality ! N. Nigeria : Nupe ! Exsicc.—*Afzelius*. *Barter* 1032 ; 1700.

16. PHYLLANTHUS Linn.—F.T.A. 6, 1 : 692.

Flowering branchlets fasciculate :

Flowers produced on clustered slender leafless racemes of fascicles arising in the axil of a leafy flowerless shoot (resembling a pinnate leaf) ; leaves ovate or ovate-elliptic, mucronate, rounded at the base, 2·7 cm. long, 1·5–4 cm. broad, glabrous, glaucous below ; male pedicels very slender, about 2 mm. long ; sepals 5 ; stamens 5 ; filaments free ; fruits depressed-globose, 3 mm. diam. .. .. 1. *floribundus*

Flowers in fascicles of racemes on the older leafless branchlets ; barren leafy shoots crowded at the tops of the shoots and resembling pinnate leaves ; leaves ovate or ovate-lanceolate, subacute, 5–6 cm. long, 2·5–3·5 cm. broad, glabrous, glaucous below ; male pedicels short ; other characters more or less as above. 2. *Wildemannii*

Flowers dioecious ; the male flowering branchlets usually leafy towards the apex, produced in clusters on the younger wood in the axil of a leafy flowerless shoot ; leaves ovate, acutely acuminate, rounded or slightly cuneate at the base, 2·5–7 cm. long, 2–4 cm. broad, paler below ; sepals and stamens 4 ; filaments free .. .. 3. *profusus*

Flowering branchlets not in fascicles :

Filaments free to the base or rarely some free and the others connate :

Disk of the male flowers annular ; leaves ovate-elliptic to obovate-oblanceolate, mostly rounded at the apex, rounded to cuneate at the base, 2·5–10 cm. long, 2–4 cm. broad, usually glabrous below ; flowers dioecious, the males numerous in fascicles in the leaf-axils, the females paired ; sepals and stamens 4 ; filaments all free ; fruit 3–4-lobed, about 8 mm. diam. .. .. 4. *discoideus*

Disk of the male flowers composed of separate glands :

Stamens 4 or 5 :

Two or three of the filaments connate to the apex, the others free ; flowers monoecious, 1 female and 2–3 or more males in each fascicle ; sepals 5 ; leaves oblong or elliptic, rounded at both ends, 1·5–4 cm. long, 0·7–1·5 cm. broad, glabrous or crisped-pubescent ; branchlets pubescent or glabrous ; fruit about 7 mm. diam. 5. *reticulatus*

All the filaments quite free :

Pedicels very slender, up to 2 cm. long ; leaves obovate or elliptic-obovate, rounded or subacute and slightly mucronate, obtuse or slightly cuneate at the base, 8–15 mm. long, 6–12 mm. broad, glabrous, glaucous green below ; male sepals and stamens 5 ; fruits 2 mm. diam. .. .. .. 6. *capillaris*

Pedicels shorter and stouter, usually less than 3 mm. long ; leaves oblong-lanceolate or linear-lanceolate, subacute, up to 2 cm. long and 8 mm. broad, glabrous, glaucous below ; flowers monoecious, males below, females above, male sepals and stamens 5 ; fruits depressed-globose, about 2 mm. diam. 7. *pentandrus*

Stamens 3, free ; flowers dioecious :

Branchlets pubescent ; leaves ovate, obtuse or rounded at the apex, subcordate at the base, 1–2 cm. long, 5–12 mm. broad ; stipules deciduous ; male pedicels paired, 5 mm. long, females solitary, stouter ; sepals 6, in 2 series ; capsule globose, 6 mm. diam. .. .. 8. *alpestris*

Branchlets glabrous ; leaves elliptic or oblong-elliptic, unequally rounded or subcordate at the base, rounded at the apex, 6–12 mm. long, 4–6 mm. broad, closely papillous, with a thick margin ; flowers dioecious, males solitary, on very slender pedicels up to 3 mm. long ; the females solitary on pedicels about 1 cm. long 9. *monticola*

FIG. 118.—PHYLLANTHUS FLORIBUNDUS *Muell. Arg.* (EUPHORBIACEAE).

A, male shoot. B, male flower. C, stamen. D, female flower. E, pistil with disc-glands. F, fascicle of female flowers. G, fruit. H, transverse section of fruit.

Branchlets glabrous ; leaves lanceolate to ovate, mucronate, cordate at the base, 1·5–3 cm. long, 0·6-1·2 cm. broad, glabrous, paler below ; stipules deciduous ; male pedicels fasciculate, 4 mm. long, female solitary ; sepals 6 ; capsule 6-lobulate, 6·5 mm. diam. .. .. 10. *leonensis*

Filaments connate the whole length or nearly so ; stamens 3 :

Sepals of both sexes 5, those of the females in a single series :

Styles absent ; stigmas sessile ; leaves slightly woolly-pubescent, oblong-elliptic, rounded at both ends, 3-8 mm. long ; flowers axillary, solitary, the males towards the base, the females in the upper part of the branchlets .. .. .. 11. *sublanatus*

Styles present, sometimes rather short ; leaves not woolly-pubescent :

Ovary prominently warted ; styles very slender and free, bilobed to about the middle, lobes linear, terete ; leaves oblong or oblong-lanceolate, mucronate, 6-8 mm. long, glabrous ; male flowers 2–3 together in the lower leaves, females solitary in the upper axils .. .. 12. *niruroides*

Ovary smooth ; styles very short and bifid ; leaves oblong or elliptic, rounded at both ends, 4-12 mm. long, glabrous ; flowers monoecious, 1 male and 1 female in each leaf-axil .. ..13. *amarus*

Sepals of both sexes 6, those of the female often in 2 series :

Ovary warted ; branchlets narrowly winged, asperulate ; leaves oblong, shortly pointed and minutely mucronate, rounded at the base, 0·6–1·2 cm. long, margins asperulate, glaucous below ; flowers monoecious, solitary and subsessile 14. *Urinaria*

Ovary smooth :

Disk of the female flowers consisting of separate glands ; branchlets sharply angular ; leaves linear to oblanceolate, up to 4 cm. long, and 1·3 cm. broad ; stipules broad and auriculate at the base ; male and female flowers sometimes together in the leaf-axils or the female solitary and larger 15. *maderaspatensis*

Disk of the female flowers annular, saucer-shaped or cupular :

Stems arising from a thick woody rhizome ; leaves linear-lanceolate, 1·3–2 cm. long, mucronate, glabrous ; branchlets winged .. .. 16. *Dusenii*

Stems not arising from a rhizome :

Ovary shortly stipitate ; styles rather short, suberect from the base, recurved ; branchlets flattened and winged ; leaves oblong, obtuse, rounded at the base, 1–2 cm. long, membranous, with 7–8 pairs of distinct lateral nerves ; male flowers few together in the axils of the lower leaves, female flowers solitary in the upper axils and larger .. .. 17. *odontadenius*

Ovary sessile :

Styles rather long, bilobed to near the middle ; leaves obovate or obovate-elliptic, rounded to an acute point, subacute at the base, 8–12 mm. long ; stipules conspicuous, with long subulate points ; flowers monoecious, males 1–3 in each leaf-axil, females about the same size .. .. 18. *Mannianus*

Styles very short, shortly bifid ; leaves oblong or oblong-elliptic, rounded at both ends, 6–12 mm. long ; stipules small, lanceolate-subulate ; flowers monoecious, solitary, the males in the lower, the females in the upper, axils 19. *Niruri*

Stamens 2, filaments connate :

Leaves elliptic to oblanceolate, obtusely pointed, obtuse or subcuneate at the base, 4–10 cm. long, 1–4 cm. broad, lateral nerves 9–10 pairs ; flowers dioecious, the males several in each fascicle with numerous membranous laciniate bracts at the base, the females few or subsolitary .. .. 20. *petraeus*

Leaves elongate-oblong or oblong-elliptic, rounded or truncate at the apex, rounded at base, 1–4·5 cm. long, up to 2·5 cm. broad ; lateral nerves 13–16 pairs ; flowers monoecious, the males quite small, the females much larger with thick reticulate sepals .. .. 21. *Beillei*

1. **Phyllanthus floribundus** *Muell. Arg.*—F.T.A. 6, 1 : 701 ; Stapf 648 ; Holl. 4 ; 583 ; Chev. Bot. 556. A glabrous shrub or woody climber, often armed with recurved spines, with copious inflorescence of minute greenish flowers, and small berry-like red fruit.
Throughout the area and extending to Congo, Nile Land and East Africa. (See Appendix).
2. **P. Wildemannii** *Beille* in Chev. Bot. 558. A small tree with soft-wooded straggling branches and small clustered grape-like fruits.
French Guinea : Conakry and Iles de Los (Feb.) ! Gold Coast : Accra Plains ! Exsicc.—*Chev.* 12721 ; 133305. *Irvine.*
3. **P. profusus** *N. E. Br.*—F.T.A. 6, 1 : 704 ; Stapf 648. Like the preceding but with stouter racemes of greyish flowers.
Liberia : Sino Basin ! Kakatown ! Exsicc.—*Whyte.*
4. **P. discoideus** *Muell. Arg.*—F.T.A. 6, 1 : 707 ; Holl. 4 : 582 ; Chev. Bot. 556 and 559 (as *Cicca discoidea* Baill.). *Fluggea Klaineana* Pierre ex A. Chev. Bot. 559, name only. *F. oborata* var. *luxurians* Beille. A tree 30–50 ft. high, or occasionally a shrub with slightly pubescent branchlets.
Throughout the area and extending to Angola, Nile Land and East Africa. (See Appendix).
5. **P. reticulatus** *Poir.*—F.T.A. 6, 1 : 700 ; Holl. 4 : 583 ; Chev. Bot. 558 (as *P. Prieurianus* Muell. Arg.). An erect slender-branched shrub, usually pubescent ; fruit depressed-globose, black when ripe.
Throughout the area and extending to Angola, Nile Land, East Africa and Transvaal.
Var. **glaber** Muell. Arg. similar to the type but entirely glabrous.
Ivory Coast : Tano R. ! Gold Coast : Kwitta ! Salaga ! S. Nigeria : Lagos ! Lagos Colony ! Lower Niger R. ! Also in Angola, Uganda and East Africa. Exsicc.—*Thonning. Millen* 53. *Rowland. T. Vogel* (no number). *Chipp* 347. *Saunders* 800. (See Appendix).

6. **P. capillaris** *Schum. & Thonn.*—F.T.A. 6, 1 : 709 ; Stapf 648 ; Chev. Bot. 556. A weak shrublet, erect, 2–4 ft. high or trailing ; flowers in very small axillary fascicles, the females often solitary.
From French Guinea to Cameroons, extending to Angola, Nile Land, East Africa to S. Rhodesia.
7. **P. pentandrus** *Schum. & Thonn.*—F.T.A. 6, 1 : 710 ; Holl. 4 : 583 ; Chev. Bot. 558. A glabrous much-branched woody herb, up to 18 in. high ; flowers small, males 2–3 together in the lower axils on the branchlets, females solitary in the upper axils.
Throughout the area and extending to S. Africa. (See Appendix).
8. **P. alpestris** *Beille*—F.T.A. 6, 1 : 712 ; Chev. Bot. 556. An undershrub 4–8 in. high, with short woody stems arising from a thick rootstock ; flowering branchlets compressed.
French Guinea : Futa Jallon and other localities, 3,000–3,600 ft. ! Sierra Leone : sources of the Niger, Soukarala, at foot of Mt. Taforo. Exsicc.—*Chev.* 12305 ; 12907 ; 12943.
9. **P. monticola** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, incd. A shrub 4–6 ft. high with slightly striate branches, sometimes half scrambling.
Sierra Leone : Regent (Apr.) ! Sugarloaf Mt. " plentiful above 2,000 ft." ! York Pass ! Exsicc.—*Sc. Elliot* 3962 ; 5819. *Lane-Poole* 424.
10. **P. leonensis** *Hutch.* in Kew Bull. 1917 : 232. Stems erect, 18 in. or more high from a woody stock, male flowers on short capillary pedicels, female pedicels up to ¼ in. long.
Sierra Leone : Sendugu (June) ! Exsicc.—*Thomas* 580. *Burbridge* 547.
11. **P. sublanatus** *Schum. & Thonn.*—F.T.A. 6, 1 : 715. *P. microdendron* A. Chev. Bot. 557, not of Welw. Erect woody herb, 18 in. to 2 ft. high, with glabrous branches ; flowers minute on very short pedicels.
French Sudan : Sikasso ! Sierra Leone : Buyabuya, Scarcies R. (Feb.) ! Gold Coast : Accra ! S. Nigeria : Lagos (May) ! Exsicc.—*Thonning. Ansell. Sc. Elliot* 4267. *Dalz.* 1360. *Chev.* 804.
12. **P. niruroides** *Muell. Arg.*—F.T.A. 6, 1 : 715 ; Chev. Bot. 558. A glabrous woody herb, up to 2½ ft. high ; flowers minute on very short pedicels ; fruit minutely warted.
French Guinea : Kouria. Sierra Leone : Freetown ! Kambia (Dec.) ! Togo : Misahöhe. S. Nigeria : Calabar (July) ! Awka ! Also in French Cameroons and Gabon. Exsicc.—*Welwitsch* 316. *Sc. Elliot* 4346. *Holl.* 44. *Thomas* 622.
13. **P. amarus** *Schum. & Thonn.*—F.T.A. 6, 1 : 717 ; Holl. 4 : 582 ; Chev. Bot. 556. A woody herb, 1–2 ft. high, glabrous, with minute flowers on short pedicels ; fruit smooth.
A fairly common weed in gardens and waste places, from Liberia to Nigeria and Fernando Po, extending to Congo, Nile Land and Tanganyika. Exsicc.—*Thonning. T. Vogel* (no number). *Whyte. Dawodu* 24. *Dalz.* 763. (See Appendix).
14. **P. Urinaria** *Linn.*—F.T.A. 6, 1 : 721. A woody herb about 1 ft. high with minute flowers and warted fruit.
Sierra Leone : Regent, on rocks (Dec.) ! A common tropical weed but apparently very rare in Africa.
15. **P. maderaspatensis** *Linn.*—F.T.A. 6, 1 : 722 ; Chev. Bot. 557. A woody undershrub of variable habit, glabrous or slightly asperulate ; capsule smooth.
French Sudan : Mossi, near Koupéla. Senegal : Niayes. Gold Coast : Accra (June) ! N. Nigeria : Sokoto (Aug.) ! In cultivated fields, etc., throughout the tropical and subtropical regions of the Old World : Exsicc.—*Thonning. Dalz.* 139 ; 391.
16. **P. Dusenii** *Hutch.*—F.T.A. 6, 1 : 723. Stems flexuous, about 1 ft. high, puberulous, the flowering branchlets crowded towards the top ; flowers small, solitary, males several, female usually about 1 only in the uppermost axil.
S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Dusen* 296. *Talb.* 2323.
17. **P. odontadenius** *Muell. Arg.*—F.T.A. 6, 1 : 727. A glabrous woody herb, 1–3 ft. high ; capsule globose, enclosed in the pale persistent sepals.
French Guinea : Futa Jallon ; Dalaba-Diaguissa ! Liberia : Kakatown ! Gold Coast : Aburi Hills (Oct.) ! Kumassi ! Togo ! S. Nigeria : Lagos (July) ! Ibadan ! Oban ! Awka ! Also in French Cameroons, St. Thomas Island and Angola. Exsicc.—*Johnson* 471. *Cummins* 77. *Whyte. Dalz.* 1361. *Talb.* 623. *Thomas* 1012. *Schiechter* 12345 ; 13014. *Chev.* 18362 ; 18723 ; 18784 ; 18844.
18. **P. Mannianus** *Muell. Arg.*—F.T.A. 6, 1 : 730 ; Chev. Bot. 557. Erect woody herb, up to 4 ft. high, with angled glabrous branchlets.
Ivory Coast : Mt. Gbon, summit 3,500 ft. ! Cameroons Mt. : 7,000 ft. (Jan.) ! Exsicc.—*Mann* 1231 ; 1998. *Johnston* 69. *Dalz.* 8336. *Chev.* 21415.
19. **P. Niruri** *Linn.*—F.T.A. 6, 1 : 731 ; Holl. 4 : 583 ; Chev. Bot. 557. Annual herb about 1 ft. high with smooth sulcate stem and slightly winged branchlets.
French Sudan : Sompi. Senegal (*Perrottet*, not seen). Gold Coast (*Thonning*, not seen). N. Nigeria : Nupe ! Extends to Nile Land, Uganda and East Africa. A weed widely spread in the tropics. Exsicc.—*Barter* 825.
20. **P. petraeus** *Chev.*—F.T.A. 6, 1 : 733 ; Chev. Bot. 558. A shrub 3–7 ft. high ; branchlets sulcate, with a line of short hairs up each side when young ; leaves glaucous below.
French Guinea : between Santa R. and Timbo ; Kouria to Longuéry (in ground submerged in flood) ; edge of Konkouré R. Sierra Leone : Wallia, Scarcies R. (Jan.) ! Mabum (Aug.) ! Exsicc.—*Sc. Elliot* 4367. *Thomas* 1627.
21. **P. Beillei** *Hutch.*—F.T.A. 6, 1, : 733. A shrub 3–7 ft. high ; branchlets terete, puberulous ; leaves glaucous below.
Sierra Leone : on the upper part of Sugarloaf Mt. (Dec.) ! York Pass ! Togo ! Also in French Cameroons and Upper Shari region. Exsicc.—*Sc. Elliot* 3961. *Lane-Poole* 438. *Kersting* 44.

17. FLUGGEA Willd.—F.T.A. 6, 1 : 736.

Shrub or small tree ; leaves elliptic or obovate, cuneate at the base, up to 6 cm. long and 3 cm. broad, rigidly membranous, glabrous, often glaucous below ; flowers dioecious, the males in axillary fascicles on slender pedicels up to 5 mm. long ; stamens 5, free ; rudimentary ovary tripartite ; female disk annular ; fruits depressed-globose, about 5 mm. diam. ; seeds shining with several lines of pits on the back .. .. .. *virosa*

F. virosa *Baill.* Etud. Gen. Euph. 593. *F. microcarpa* Blume.—F.T.A. 6, 1 : 736 ; Holl. 4 : 584 ; Chev. Bot. 559. Up to 12 ft. high, with somewhat angular glabrous branchlets ; fruit a small white berry. A very common African plant and liable to be mistaken for a species of *Phyllanthus*. The large tripartite rudimentary ovary is the distinguishing feature. (See Appendix).

18. UAPACA Baill.—F.T.A. 6, 1 : 634.

Leaves pilose on the midrib and nerves below, obovate, rounded at the apex, slightly cuneate or rounded at the base, 9–13 cm. long, 4–9 cm. broad ; lateral nerves 7–8 pairs ; petiole 2–2·5 cm. long ; male peduncle about 1 cm. long ; bracts obovate, softly pubescent ; fruits subglobose, 2·5 cm. diam., warted .. 1. *togoensis*
Leaves glabrous below :
Calyx of the male flowers glabrous outside :

Leaves elongate-obovate, shortly acuminate, much narrowed to the base, 20–35 cm. long, 7–14 cm. broad, thin ; lateral nerves 11–14 pairs ; male peduncles up to 3 cm. long ; bracts glabrous, 1·5–2 cm. long .. .. 2. *Staudtii*

Leaves oblong-oblanceolate, rounded or obtusely pointed, acutely cuneate to the base, 6–15 cm. long, 4–6 cm. broad, leathery ; lateral nerves 10–15 pairs ; male peduncles up to 2 cm. long ; bracts glabrous, 1 cm. long .. .. .. 3. *Heudelotii*

Calyx of the male flowers pilose outside ; leaves obovate to oblanceolate, rounded or obtusely pointed, more or less cuneate, 10–32 cm. long, 6–17 cm. broad ; lateral nerves 6–11 pairs ; male peduncles 1·3 cm. long ; bracts glabrous, about 1 cm. long 4. *guineensis*

1. **Uapaca togoensis** *Pax*—F.T.A. 6, 1 : 638 ; Chev. Bot. 563. *U. Chevalieri* Beille. A tree of riverside forests, 30 ft. high.
Sierra Leone : Talla, Mt. Gonkwl (Feb.) ! Worawala (Apr.) ! French Guinea : Futa Jallon, Ditinn ! Dalaba ! Diaguissa ; 3,000–4,000 ft. ! Togo : Sokode (Mar.) ! Dahomey : Atacora Mts. ! Exsicc.—*Sc. Elliot* 4828. *Lane-Poole* 3. *Kersting* 22. *Chev.* 12670 ; 13477 ; 18887. (See Appendix).
2. **U. Staudtii** *Pax*—F.T.A. 6, 1 : 638 ; Holl. 4 : 582. A tree of swamp and fringing forest, 40–90 ft.
S. Nigeria : Oni ! Cameroons Mt. : Buea. Also in French Cameroons. Exsicc.—*Sankey* 14. (See Appendix).
3. **U. Heudelotii** *Baill.*—F.T.A. 6, 1 : 639 ; Holl. 4 : 581 ; Chev. Bot. 563. *U. benguelensis* A. Chev. Bot.

FIG. 119.—FLUGGEA VIROSA *Baill.* (EUPHORBIACEAE).

A, male flower with rudimentary ovary. B, C, perianth segments. D, stamens from side and back. E, female flower. F, fruit. G, cross section of fruit. H, longitudinal section of fruit.

562, not of Muell. Arg. A tree up to 60 ft. high with girth up to 19 ft. ; in evergreen and savannah forests near water.
Senegambia to Cameroons. Exsicc.—*Heudelot* 836. *Barter* 1151. *Mann* 2268. *Sc. Elliot* 4925 ; 4946 ; 5150. *Rowland. Staudt* 652. *Chev.* 15317 ; 16163 ; 16455. (See Appendix).
4. **U. guineensis** *Muell. Arg.*—F.T.A. 6, 1 : 640 ; Holl. 4 : 581 ; Lely 113 ; Chev. Bot. 562. A tree 40–70 ft. high in moist and fringing forests, smaller and with the habit of a *Ficus* in open country. Fruit ovoid, about 1 in. long, yellowish, glabrous.
Throughout the area and extending to Ubangi-Shari, Uganda, Congo and Angola. Exsicc.—*T. Vogel* 194. *Barter* 1693 ; 1833 ; 1834 ; 2116. *Mann* 74. *Sc. Elliot* 5395. *Whyte. Talb.* 3050 *Dalz.* 529. *Yates* 24 ; 24a. (See Appendix).

19. MICRODESMIS Planch.—F.T.A. 6, 1 : 741.

Stamens inserted at the base of the rudimentary ovary ; disk absent ; branchlets pubescent ; leaves oblong to oblong-obovate, caudate-acuminate, cuneate and unequal-sided at the base, up to 15 cm. long and 5 cm. broad, dentate or subentire ; male flowers axillary fasciculate ; fruit globose, muricate, 7 mm. diam., red when ripe 1. *puberula*

Stamens inserted on a fleshy disk surrounding and adnate to the rudimentary ovary, otherwise very similar to above .. .. 2. *Zenkeri*

1. **M. puberula** *Hook. f.*—F.T.A. 6, 1 : 741 ; Holl. 4 : 584 ; Chev. Bot. 568. A low bush or a small tree up to 15 ft. high, and 1 ft. or more in girth.
Common from Senegal to S. Nigeria. (See Appendix).
2. **M. Zenkeri** *Pax*—F.T.A. 6, 1 : 742. A shrub 6–10 ft. high.
S. Nigeria : Oban ! Cameroons Mt. : Victoria (Jan.) ! Johann-Albrechtshöhe ! Also in French Cameroons and extending to Angola. Exsicc.—*Talb.* 692. *Kalbreyer* 28. *Staudt* 545. *Dalz.* 8194.

FIG. 120.—UAPACA GUINEENSIS *Muell. Arg.* (EUPHORBIACEAE).

A, young inflorescence with involucre. B, longitudinal section of male inflorescence. C, male flower with rudimentary ovary. D, stamen. E, rudimentary ovary. F, female flower with involucre. G, female flower. H, fruit. I, cross section of fruit.

20. HEVEA Aubl.—F.T.A. 6, 1 : 743.

Leaves digitately trifoliolate ; leaflets stalked, elliptic or elliptic-oblanceolate, acuminate, narrowed to the base, 8–20 cm. long, 2·5–8 cm. broad, entire, glabrous, often glaucous below ; lateral nerves about 20 pairs, looped near the margin, prominent below ; stalks of leaflets each with a large flat orbicular gland at the base, the glands almost merged into one ; petiole up to 25 cm. long ; panicles below the leaves on each young shoot ; male flowers numerous, females fewer ; capsule 3-lobed, about 4·5 cm. diam. ; seeds broadly oblong or oblong-ellipsoid, about 2·5 cm. long, 2 cm. broad ; testa mottled and speckled, slightly shining .. .. *brasiliensis*

H. brasiliensis *Muell. Arg.*—F.T.A. 6, 1 : 743 ; Holl. 4 : 585. A tree about 60 ft. high, cultivated for its rubber-producing qualities ; native of Para, Brazil.

21. RICINODENDRON Muell. Arg.—F.T.A. 6, 1 : 744.

Leaves digitately 3–5-foliolate ; leaflets sessile, obovate to obovate-elliptic, acuminate, narrowed to the base, the lateral ones often smaller, 6–20 cm. long, 2·5–12 cm. broad, glandular-denticulate, stellate-puberulous when young ; lateral nerves 10–16 pairs ; petiole up to 20 cm. long ; stipules large, foliaceous, persistent, suborbicular, up to

FIG. 121.—RICINODENDRON AFRICANUM *Muell. Arg.* (EUPHORBIACEAE).

A, male flower. B, same with disc-glands removed. C, stamen. D, female flower. E, pistil. F, cross section of ovary. G, fruit.

2·5 cm. long, deeply toothed ; male panicles slender, about 30 cm. long ; stamens 10 ; disk-glands erect ; fruit 2-lobed, 2-celled, 2 cm. long, 3 cm. broad .. .. *africanum*

R. africanum *Muell. Arg.*—F.T.A. 6, 1 : 745 ; Holl. 4 : 590 ; Chev. Bot. 571. A large tree of fringing forests, 30–100 ft. or more high with girth up to 8 ft., and very short buttresses ; inflorescence yellow-tomentose.
French Guinea : Futa Jallon, Kouria. Sierra Leone : Bagroo R. (Apr.) ! Freetown ! Ky Yema (Apr.) ! Ivory Coast : various localities ! Gold Coast : Aburi (Dec.) ! New Juaben (Mar.) ! Axim ! Kibbi (Feb.) ! S. Nigeria : Benin ! Oban ! Calabar ! Fernando Po (Jan.) ! Also in Cameroons and extending to Angola, Uganda and East Africa. Exsicc.—*Mann* 229 ; 825. *Johnson* 448 ; 635. *Williams* 6. (See Appendix).

22. CROTON Linn.—F.T.A. 6, 1 : 746.

Leaves digitately 3–5-lobed to near the base, up to 10 cm. long and broad ; segments oblanceolate or obovate, acuminate, narrowed to the base, crenate or crenate-serrate ; flowers monoecious, the lower half of the inflorescence consisting of subsessile female flowers, the upper part of much smaller males ; fruit setose, 8 mm. long 1. *lobatus*
Leaves not lobed or rarely slightly so :
Leaves entire :
Leaves clustered on much-shortened branchlets, glabrous, oblanceolate to obovate, rounded at the apex, 1·3–4 cm. long, up to 1·8 cm. broad, membranous ; male racemes very short, about 5-flowered, 6 mm. long ; female flowers solitary on a branchlet separate from the males .. .. 2. *Scarciesii*
Leaves laxly arranged on more or less elongated branchlets, hairy or scaly :
Petals absent from the female flowers or very rudimentary ; leaves ovate, acutely

FIG. 122.—CROTON AMABILIS *Muell. Arg.* (EUPHORBIACEAE).

A, male shoot. B, under surface of leaf showing peltate scales. C, stipule. D, portion of stem. E, peltate scale. F, bract. G, male flower. H, female shoot. I, female flower. J, fruit. K, cross section of fruit. L, seed. M, embryo.

acuminate, rounded and not glandular at the base, up to 7·5 cm. long and 5 cm. broad, membranous, stellate-pubescent on both surfaces; inflorescence bisexual, the lower part female, the upper part male, up to 5 cm. long .. 3. *membranaceus*

Petals absent from the female flowers; leaves oblong-lanceolate or elliptic-oblong, very acute, rounded at the base, 6–10 cm. long, 2–4 cm. broad, densely clothed with orbicular scales on both surfaces, those below fringed; petiole with a pair of flat sessile glands at the apex; inflorescence unisexual, female only known, terminal; capsule densely scaly .. .. 4. *leonensis*

Petals present and well developed in the female flowers; leaves oblong-lanceolate or oblong-elliptic, acutely acuminate, rounded at the base, up to 15 cm. long and 6 cm. broad, papery, scaly and silvery-grey below; lateral nerves about 12 pairs; flowers dioecious, racemes often crowded .. .. .. 5. *amabilis*

Leaves toothed or rarely shortly lobed:

Leaves very minutely and remotely toothed:

Leaves rounded or subcordate at the base:

Leaves broadly elliptic-ovate or oblong, shortly acuminate, with 2 sessile glands at the base, 5–7 cm. long, 2·5–5 cm. broad, glabrous; racemes about 15 cm. long 6. *dispar*

Leaves broadly ovate-rounded, shortly acuminate, up to 11 cm. long and 9 cm. broad, with 2–4 stipitate glands at the base, shortly stellate-pubescent on both surfaces; racemes normally unisexual, up to 25 cm. long, many-flowered 7. *macrostachys*

Leaves shortly cuneate at the base, obovate-elliptic, abruptly cuneate, 7–9 cm. long, 3·5–5 cm. broad, thin, very thinly stellate-pubescent on both surfaces, remotely and obscurely toothed; basal glands sessile; racemes about 20 cm. long, unisexual; flowers in fascicles; male pedicels slender, about 1 cm. long 8. *Collenettei*

Leaves very distinctly toothed:

Racemes unisexual; glands at the base of the leaf sessile or subsessile; leaves oblong or oblong-elliptic, subcaudate-acuminate, rounded at the base, 9–18 cm. long, 4–8 cm. broad, with a few scattered hairs below, crenate; male racemes elongated, slender, up to 30 cm. long .. .. 9. *longiracemosus*

Racemes bisexual:

Female flowers several on each inflorescence; basal leaf-glands mostly stalked:

Racemes with very few male flowers at the top of the inflorescence; leaves up to about 2·5 cm. broad, lanceolate, obtuse at both ends, 2–9 cm. long, crenate, glabrous .. .. 10. *Chevalieri*

Racemes with numerous male flowers in the upper part:

Leaves about 5 cm. broad, elliptic or oblong-elliptic, acutely acuminate, obtuse at the base, 6·5–11 cm. long, about 5 cm. broad, glabrous, biglandular at the base; racemes slender .. .. 11. *nudifolius*

Leaves about 6 cm. broad, ovate-elliptic or oblong-ovate, obtusely caudate-acuminate, rounded or broadly cuneate at the base, with a pair of disk-like sessile glands at the base, 8–14 cm. long, crenate, sparingly pubescent on both surfaces; racemes about 20 cm. long .. .. .. 12. *Lehmbachii*

Leaves broadly elliptic or ovate-elliptic, shortly and abruptly acuminate, rounded or cuneate at the base, with a pair of long-stalked glands at the base, 8–14 cm. long, 5–8 cm. broad, crenate; racemes pendulous, up to 30 cm. long 13. *penduliflorus*

Female flowers 1–2 on each inflorescence; basal leaf-glands sessile: leaves elliptic or lanceolate-elliptic, up to 7·5 cm. long and 3 cm. broad, serrate, glabrous except for a few stellate hairs below .. .. 14. *nigritanus*

1. **Croton lobatus** *Linn.*—F.T.A. 6, 1: 750; Holl. 4: 592; Chev. Bot. 570. An erect branched pubescent annual, 2–3 ft. high, woody at the base.
A fairly common weed throughout the area, extending to Abyssinia, Nile region and Arabia. (See Appendix).
2. **C. Scarciesii** *Scott-Elliot*—F.T.A. 6, 1: 752; Chev. Bot. 571. A shrub 6–10 ft. high with glabrous branchlets; capsule bristly with tubercle-based hairs.
Sierra Leone: near Mofari on rocks partly in water (Jan.)! Near Sasseni (Jan.)! Njala (Jan.)! Ivory Coast: R. Comoe, between Alépé and Malamalasso, in a rocky stream-bed; Abiati. Exsicc.—*Sc. Elliot* 4432; 4518. *Dalz.* 8059.
3. **C. membranaceus** *Muell. Arg.*—F.T.A. 6, 1: 755. An undershrub 3 ft. high, with stellate-pubescent branchlets.
N. Nigeria: near Lokoja! Wuru, Nupe! S. Nigeria: Onitsha! Exsicc.—*Barter* 574; 615; 814.
4. **C. leonensis** *Hutch.*—F.T.A. 6, 1: 1050. A shrub or tree? Branchlets sulcate when young, densely covered with orbicular scales; capsule scaly.
Sierra Leone: ? locality! Exsicc.—*Sc. Elliot* 5716.
5. **C. amabilis** *Muell. Arg.*—F.T.A. 6, 1: 757; Holl. 4: 591. A small tree 20–30 ft. high; branchlets sulcate, grey, scaly; capsule scaly, ¼ in. diam.; often planted in native towns.
Gambia: Georgetown (Jan.)! Sierra Leone: Freetown! Waterloo (Mar.)! Allen Town (Dec.)! Togo: Fulandi-Kedia! Dahomey: Adjara (Jan.)! Djougou! N. Nigeria: Ilorin! Kontagora (Feb.)! Sokoto (Feb.)! Sokwoi (Mar.)! S. Nigeria: Lagos! Lagos Colony! Abeokuta (Feb.)! Oban! Okuni (Jan.)! Exsicc.—*Daniell. Kirk* 27. *Barter* 3323. *Millen* 14. *Rowland. Irving. Punch* 20. *Foster* 33. *Dalz.* 281; 8055. *Lely* 802. *Chev.* 22756; 23876. *Kersting* A. 516. (See Appendix).
6. **C. dispar** *N. E. Brown*—F.T.A. 6, 1: 763; Stapf 648. A tree; young branchlets and inflorescence rusty-scaly.
Liberia: Monrovia! Exsicc.—*Whyte.*

7. **C. macrostachyus** *Hochst.*—F.T.A. 6, 1 : 772. *C. guerzesiensis* Beille in Chev. Bot. 570, name only. A tree up to 30–40 ft. high ; flowers small, white, in racemes ; fruit slightly 3-lobed, ½ in. in diameter.
French Guinea : Guerzé country, between Lola and Nzo, in forest clearings (Mar.) ! Also in Belgian Congo and East Africa from Eritrea to Zambesi. Exsicc.—*Chev.* 20979.
8. **C. Collenettei** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A tree about 25 ft. ; flowers deep cream, in long stiff racemes.
French Guinea : Maceuta, 2,000 ft. (May) ! Exsicc.—*Collenette* 15.
9. **C. longiracemosus** *Hutchinson*—F.T.A. 6, 1 : 1052. A tree with smooth green bark, 60–80 ft. high, and bole of 6–8 ft. girth ; branchlets glabrous or nearly so.
S. Nigeria : Oni ! Cameroons Mt., Buea (Apr.) ! Exsicc.—*Sankey* 10. *Reder* 24.
10. **C. Chevalieri** *Beille*—F.T.A. 6, 1 : 769 ; Chev. Bot. 570. A shrub with grey glabrous branchlets, stellate-pubescent when young.
Ivory Coast : Prolo, Lower Cavally ! Exsicc.—*Chev.* 19861.
11. **C. nudifolius** *Baker & Hutch.*—F.T.A. 6, 1 : 769 ; Chev. Bot. 571. A tufted shrub ; branchlets almost fleshy, green, slightly puberulous.
Sierra Leone : Sasseni, Scarcies R. ! Kahreni, Limba (Apr.) ! Ivory Coast : between Kourokora and Touna, on inundation flats of Sassandra R. (May). Exsicc.—*Sc. Elliot* 4429 ; 5583.
12. **C. Lehmbachii** *Hutchinson*—F.T.A. 6, 1 : 1052. A small tree about 10 ft. high ; branchlets glabrous-tuberculate, slightly stellate-puberulous when young.
Cameroons Mt., Buea ! Exsicc.—*Lehmbach* 19. *Deistel.*
13. **C. pendulifloras** *Hutch.* in Kew Bull. 1928, ined. A tree with sulcate glabrous branchlets.
Sierra Leone : Kennema (May) ! Exsicc.—*Aylmer* 138. *Lane-Poole* 269.
14. **C. nigritanus** *Scott-Elliot*—F.T.A. 6, 1 : 770. A shrub ; young branchlets stellate-scaly, becoming glabrous.
French Guinea : Farana, woody undergrowth by the Niger (Mar.) ! Sierra Leone : Pujehun (Apr.) ! Konnoh country ! Liberia : Webba, on Cavally R. N. Nigeria : Lokoja ! Exsicc.—*Sc. Elliot* 5379 ; 5380. *T. Vogel* 165. *Aylmer* 60. *Burbridge* 482.

23. CLUYTIA Linn.—F.T.A. 6, 1 : 805.

Young branchlets densely woolly-tomentose ; leaves narrowly lanceolate, subacute, narrowed to the base, 6–12 cm. long, 1–2 ·5 cm. broad, membranous, densely pubescent on the nerves below ; lateral nerves 11–15 pairs ; flowers monoecious, several males and 1–2 females in each leaf-axil ; male pedicels short, female up to 1·3 cm. in fruit, the latter subglobose, 6 mm. diam., thinly pubescent .. .. *kamerunica*

C. kamerunica *Paz*—F.T.A. 6, 1 : 805. A shrub 3–5 ft. high, with densely tomentose branchlets and small axillary flowers.
Occurs in the Bambuttu Mts., near Markt Singwa, at 6,000 ft. (*Ledemann* 1658), and possibly within the Nigerian border.

24. JATROPHA Linn.—F.T.A. 6, 1 : 775.

Leaves undivided and penninerved, sessile, linear or linear-lanceolate, 9–15 cm. long, up to 3 cm. broad, serrulate, or sometimes broader (6 cm.) and more coarsely toothed : Leaves shortly pilose below ; cymes short, few-flowered, with gland-tipped laciniate bracts .. .. 1. *neriifolia*
Leaves glabrous below ; bracts linear, toothed .. .. .. 2. *atacorensis*
Leaves variously divided or digitately nerved :
Petioles furnished with numerous stipitate glands resembling the stipules ; leaves digitately 3–5-lobed beyond the middle, up to 13 cm. in diam., lobes obovate or obovate-oblanceolate, gland-toothed and shortly pubescent ; cymes pedunculate, lax ; bracts linear-lanceolate, with stipitate glands on the margin 3. *gossypiifolia*
Petioles not glandular :
Leaf-segments 11–12, pinnatisect or pinnately lobed, lobes acute, apex tailed, 10–15 cm. long, 2·5–5 cm. broad, more or less glaucous below ; cymes 2·5–5 cm. long ; peduncle up to 16 cm. long ; sepals entire .. .. 4. *multifida*
Leaf-segments or lobes toothed or rarely entire :
Leaves glabrous or nearly so :
Leaf-segments toothed, ovate, sharply 5–8-dentate ; stipules divided into filiform glabrous gland-tipped segments ; sepals entire or with a few glandular teeth 5. *Chevalieri*
Leaves undulately 5-lobed or entire ; stipules very small ; sepals entire 6. *Curcas*
Leaves pubescent, 3-lobed to below the middle, 9–15 cm. long, 9–12 cm. broad, glandular-serrate ; lobes lanceolate, acute ; stipules dissected, glandular at the apex ; sepals pubescent and glandular-ciliate .. .. 7. *kamerunica*

1. **Jatropha neriifolia** *Muell. Arg.*—F.T.A. 6, 1 : 781. Stems pubescent, about 1 ft. high from a woody base, with viscid greenish sap ; flowers small, brick-red.
N. Nigeria : Nupe ! Abinsi, on laterite (May) ! Exsicc.—*Barter* 1679. *Dalz.* 752.
2. **J. atacorensis** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8d : 206 (1912) ; Bot. 568. Habit of the last.
Dahomey : Atacora Mts., Somba country, Toukountouna, etc. (June) ! Exsicc.—*Chev.* 24070.
3. **J. gossypiifolia** *Linn.*—F.T.A. 6, 1 : 783 ; Holl. 4 : 594 ; Chev. Bot. 569. A shrub up to 6 ft. high with stout glabrous branches and glandular, often purple-tinged foliage ; flowers deep red-purple.
Planted in villages ; widely distributed in the tropics. Exsicc.—*T. Vogel* (no number). *Barter* 3353. *Warnecke* 286. (See Appendix).
4. **J. multifida** *Linn.*—F.T.A. 6, 1 : 784 ; Holl. 4 : 595 ; Chev. Bot. 569. A shrub or tree up to 20 ft. high with stout glabrous branches and coral-red flowers.
An American plant, cultivated in West Africa and elsewhere for ornament and as a hedge. Exsicc.—*Roger. Barter* (no number). *Sc. Elliot* 4708. *Warnecke* 373.
5. **J. Chevalieri** *Beille*—F.T.A. 6, 1 : 788 ; Chev. Bot. 569. A shrub about 3 ft. high, with glabrous striate branches ; fruit glabrous, ½ in. long, tipped by the base of the style.
Mauritania : Adrar, Atar, etc. Senegal : Lake Guier (Jan.) ! Cape Verde ! Niayes, on sand dunes near the sea (Dec.). Exsicc.—*Roger* 143. *Brunner* 138.

6. **J. Curcas** *Linn.*—F.T.A. 6, 1 : 791 ; Stapf 648 ; Holl. 4 : 593 ; Chev. Bot. 569. A shrub or small tree up to 20 ft. high with thick glabrous branchlets ; flowers yellowish-green ; fruit ellipsoid, scarcely lobed, about 1 in. long, black when ripe.
An American plant common in the tropics ; cultivated in West Africa. Exsicc.—*Mann* 169. *Sc. Elliot* 4067B. *Cummins*. *Warnecke* 358. (See Appendix).
7. **J. kamerunica** *Pax & K. Hoffm.*—F.T.A. 6, 1 : 795. Stem herbaceous, subsimple, 2–2½ ft. high, tomentose, nearly glabrous towards the base ; flowers yellowish-green ; fruit glabrous, slightly warted.
N.W. Cameroons ! Exsicc.—*Ledermann* 3342.

25. MILDBRAEDIA Pax—F.T.A. 6, 1 : 798.

A tree ; young branches stellate-tomentellous, at length glabrous ; leaves lanceolate-obovate or oblanceolate-elliptic, shortly and acutely acuminate, very obtuse at the base, up to 15 cm. long, 1·5–6 cm. broad, acutely repand-dentate ; lateral nerves 7–10 pairs ; stipules subulate, setulose ; male cymes few-flowered, the female cymules laxly racemose, only the terminal flower of each developed ; stamens 20 ; ovary pubescent .. .. *paniculata*

M. paniculata *Pax*—F.T.A. 6, 1 : 800 ; Chev. Bot. 587.
Ivory Coast : Middle Cavally, Oubi country, Kécta village (July) ! Sanvi ; virgin forest between Middle Sassandra and Cavally R. ; between Oubi and Fort Binger. Also in Belgian Congo. Exsicc.—*Chev.* 19332.

26. PSEUDAGROSTISTACHYS Pax & K. Hoffm. in Engl. Pflanzenr. 4, 147, 7 : 96.—F.T.A. 6, 1 : 828, as *Agrostistachys* Dalz.

A small tree 25 ft. high, glabrous ; stipules connate into a sheath, soon falling off and leaving a scar ; leaves oblong-elliptic, acute, shortly cuneate at the base, 17–40 cm. long, up to 15 cm. broad, glabrous, with 2 basal glands on the upper surface at the base ; lateral nerves 18–20 pairs, raised on both surfaces ; racemes axillary, up to 7·5 cm. long ; flowers white ; bracts striate, bifid ; stamens about 20, free ; ovary densely pilose .. .. *africana*

P. africana *Pax & K. Hoffm.* l.c. fig. 18. *Agrostistachys africana* Muell. Arg.—F.T.A. 6, 1 : 829.
Fernando Po : 4,000 ft. (Nov.) ! Also in St. Thomas Island. Exsicc.—*Mann* 582.

27. CAPERONIA St. Hil.—F.T.A. 6, 1 : 829.

Leaves palmately 5-nerved at the base, ovate, crenate, slightly cordate, acute, 8–11 cm. long, 4·5–6 cm. broad, sparingly hispid on the nerves ; stipules caducous ; racemes 4–6 cm. long ; male petals subequal ; female sepals 6 ; ovary bristly ; fruit muricate 1. *latifolia*

Leaves pinnately nerved, narrowly lanceolate, serrate :
Leaves linear, remotely serrate or sometimes subentire, up to 15 cm. long ; young stems not or very sparsely clothed with gland-tipped hairs ; racemes up to 15 cm. long ; male petals unequal ; female sepals 5–6 .. .. .. 2. *senegalensis*
Leaves lanceolate, closely serrate, up to 15 cm. long and 3·5 cm. broad ; young stems very densely setose with stiff gland-tipped hairs ; racemes up to 7·5 cm. long ; male petals unequal ; female sepals 6 .. .. 3. *palustris*

1. **Caperonia latifolia** *Pax*—F.T.A. 6, 1 : 830. An erect herb, softly hispid in the upper parts, 2 ft. high.
S. Nigeria : Victoria ! Also in St. Thomas Island and in S. America and the West Indies. Exsicc.—*Dusen* 281.
2. **C. senegalensis** *Muell. Arg.*—F.T.A. 6, 1 : 832 ; Chev. Bot. 572. A slender herb erect or half procumbent, 1½–3 ft. high, usually in moist ground, with small white flowers and roughly setose capsules.
French Sudan : Nafadié (Jan.) ! Sansanding (Feb.) ! Senegal : near Bakel ! Casamance R. ! French Guinea : Ile Tristao ! Sierra Leone : Mahela, Samu country (Dec.) ! Scarcies R. (Feb.) ! Togo : Lome ! Kpedsu (Dec.) ! Dahomey : Savalou (May) ! N. Nigeria : Nupe ! Zungeru (Aug.) ! Abinsi (Nov.) ! Kumu (Oct.) ! Lagos Colony ! Also in French Cameroons, Shari and Lower Congo. Exsicc.—*Perrottet* 737. *Sc. Elliot* 4053 ; 4271. *Barter* (no number). *Rowland*. *Dalz.* 65 ; 783. *Howes* 1044. *Chev.* 12999 ; 23709. *Warnecke* 430.
3. **C. palustris** *St. Hil.*—F.T.A. 6, 1 : 832 ; Holl. 4 : 597 ; Chev. Bot. 572. *C. macrocarpa* Pax & K. Hoffm. An erect, fairly stout herb resembling the last.
French Sudan : Cotaga ; Sébi to Mopti (Aug., Sept.) ! Ségou (Sept.) ! S. Nigeria : Lagos ; Idofu. Also in North Cameroons, Upper Benue R., Lake Chad region, East Africa to Rhodesia and S. Africa ; also in S. America and Madagascar. Exsicc.—*Chev.* 15763 ; 24978. (See Appendix).

28. CHROZOPHORA Neck.—F.T.A. 6, 1 : 834.

Prostrate undershrub, covered with soft white stellate hairs ; leaves ovate, rounded or very obtuse at the apex, long petiolate, biglandular at the base, 1·3–3 cm. long, 1–2 cm. broad ; stipules subulate ; racemes short, leafy at the base ; stamens 12–15 ; ovary tomentose ; fruits stellate-tomentose, deeply 3-lobed ; seeds rough 1. *plicata*
Usually ascending or suberect undershrubs ; fruits lepidote ; stamens up to 10 :
Indumentum of the shoots and lower surface of the leaves very woolly ; petioles fairly long ; leaves ovate-rhomboid, 2·5–4 cm. long, up to 3 cm. broad, biglandular at the base, sometimes slightly 3-lobed ; sepals in fruit sometimes elongating to 6 mm. long .. .. 2. *Brocchiana*
Indumentum of the shoots and lower surface of the leaves short and close ; petioles comparatively short ; leaves similar to preceding ; sepals not elongating in fruit 3. *senegalensis*

1. **Chrozophora plicata** *A. Juss.*—F.T.A. 6, 1 : 834 (incl. var. *obliquifolia* Prain). Flowers small, pink ; capsule red-purple ; on waste places and sandy soil.
Senegal : Dagana ; Podar. N. Nigeria : Kuka (Jan., Feb.) ! Sokoto (Nov.) ! Extends to Eastern Sudan and Abyssinia, Mozambique and Rhodesia ; also in Egypt and Palestine. Exsicc.—*E. Vogel* 3 ; 32.
2. **C. Brocchiana** *Vis.*—F.T.A. 6, 1 : 838 (incl. *C. senegalensis* var. *lanigera* Prain) ; Chev. Bot. 573. A low undershrub with stout, more or less erect stems ; scales covering the capsules whitish or violet-tinged ; in sandy soil.
Mauritania : Adrar, etc. French Sudan : Timbuktu. Senegal : Dagana ; Richard Tol ; Podar ; Tamboukana ; Dakar ; Cape Verde. N. Nigeria : Borgu ! Jebba ! Sokoto ! Bornu ! Extends to Eastern Sudan and Red Sea. Exsicc.—*Leprieur. Lelievre. Perrottet* 42. *Brunner* 108. *Barter* 812. *Moiser* (no number).
3. **C. senegalensis** *A. Juss.*—F.T.A. 6, 1 : 837 ; Chev. Bot. 573. A low undershrub, sometimes prostrate ; flowers scarlet ; capsules as in the preceding.
Mauritania : Guimi, etc. French Sudan : Bougouni (Apr.) ! marshes near San. Senegal : several localities ! Gambia : Kudang (Jan.) ! Dahomey : Mts. Atacora, 1,050–1,800 ft. N. Nigeria : Nupe ! Sokoto ! Katagum (July) ! Lemme, 2,600 ft. ! Liruwen-Kano Hills ! Extends to Shari region. Exsicc. —*Leprieur* 1194. *Perrottet* 738. *Heudelot* 419. *Barter* 3444. *Dalz.* 205 ; 8054. *Moiser* 60 ; 114 ; 197 ; 263. *Lely* 133. *Carpenter.* (See Appendix).

29. CROTONOGYNE Muell. Arg.—F.T.A. 6, 1 : 819.

Male pedicel longer than the calyx ; male petals free ; leaves crowded, elongate-oblanceolate, narrowed to a cordate-auriculate base, acuminate, up to 50 cm. long, 5–12 cm. broad ; racemes up to 60 cm. long, the flowers in both sexes occupying the greater part of the rhachis .. .. 1. *Preussii*

Male pedicel not longer than the calyx ; male petals united ; leaves scattered ; female flowers few and solitary towards the apex of the raceme :

Indumentum lepidote only or none ; ovary lepidote :

Bracts usually eglandular ; leaves oblong ; rounded at the base, gradually acuminate, 10–17 cm. long, 4–7 cm. broad, very loosely scaly below ; racemes 5–15 cm. long, the males sometimes in clusters on the old wood ; female calyx-lobes eglandular 2. *caterviflora*

Bracts always 2-glandular ; leaves obovate, long-narrowed to an acute base, abruptly and shortly acuminate, 16–28 cm. long, 5–10 cm. broad, with very few scales below ; racemes up to 30 cm. long ; female calyx-lobes with glands between 3. *Manniana*

Indumentum of stellate hairs or setae or both, associated with or replacing the flattened scales ; ovary (where known) setose :

Leaves abruptly narrowed into a distinct false petiole longer than the petiole proper, oblong-obovate, shortly acuminate, 26–30 cm. long, 6–9 cm. broad ; stipules ovate, acuminate, 0·5 cm. long, stellate-pubescent and sparingly lepidote ; racemes very long ; bracts 2-glandular ; male calyx glabrous, female scaly and densely stellate-pubescent .. .. 4. *impedita*

Leaves narrowed from beyond the middle to a narrow rounded or truncate base, elongate-obovate, acutely acuminate ; stipules narrowly oblong-lanceolate, 1·5 cm. long, strigose with stiff spreading hairs ; racemes 15-25 cm. long 5. *strigosa*

1. **Crotonogyne Preussii** *Pax*—F.T.A. 6, 1 : 821. A shrub or small tree, 15–25 ft. high, with scaly indumentum.
S. Nigeria : Oban ! Cameroons Mt. : Victoria ! Also in French Cameroons. Exsicc.—*Talb.* 691 ; 694. *Preuss* 1220.
2. **C. caterviflora** *N. E. Br.*—F.T.A. 6, 1 : 821 ; Stapf 649 ; Chev. Bot. 573. *Cyrtogonone argentea* A. Chev. Bot. 588, not of Prain. *Neomanniophyton Chevalieri* Beille in Chev. Bot. 588, name only. A shrub, 16–18 ft. high, scaly.
Liberia : Sino River ! Grand Bassa ! Fishtown ! Ivory Coast : between Middle Sassandra and Middle Cavally Rivers, in virgin forest (June–July) ! Malamalasso (Mar.) ! between Soubiré and Yaou (Mar.) ! Exsicc. —*Whyte. Dinklage* 1861 ; 2036 ; 2045 ; 2053. *Chev.* 17520 ; 17783.
3. **C. Manniana** *Muell. Arg.*—F.T.A. 6, 1 : 822. A scaly shrub 10–12 ft. high.
S. Nigeria : Eket ! Fernando Po (Jan.) ! Exsicc.—*Mann* 219 ; 220. *Talb.* 3258.
4. **C. impedita** *Prain*—F.T.A. 6, 1 : 823. A shrub 6–8 ft. high, stellate-pubescent and sparingly scaly.
S. Nigeria : Johann-Albrechtshöhe ! Also in French Cameroons. Exsicc.—*Buesgen* 163.
5. **C. strigosa** *Prain*—F.T.A. 6, 1 : 826. A shrub, all parts with stiff spreading hairs.
S. Nigeria : Oban ! Exsicc.—*Talb.* 658 ; 659.

30. CYRTOGONONE Prain—F.T.A. 6, 1 : 815.

A tree ; branchlets and under-surface of the leaves densely silvery-lepidote ; leaves long-petioled, elliptic to obovate, abruptly acuminate, widely cuneate at the base, entire or lobulate-toothed, 15–25 cm. long, 8–13 cm. broad, with a pair of glands at the base ; flowers dioecious, in large terminal narrow panicles up to 30 cm. long ; calyx globose in bud, at length splitting into 3 sepals, lepidote ; stamens numerous, erect in bud .. .. *argentea*

C. argentea *Prain*—F.T.A. 6, 1 : 815 ; Chev. Bot. 588. A tree 30–100 ft. high.
Ivory Coast : Malamalasso. S. Nigeria : Oban ! Also in French Cameroons and Spanish Guinea. Exsicc.—*Talb.* 1590.

31. MANNIOPHYTON Muell. Arg.—F.T.A. 6, 1 : 818.

A shrub or climber ; branches scabrous with short stellate hairs ; leaves polymorphous, entire and ovate or more or less 2–3-lobed, cordate at the base, tips acutely acuminate, up to 25 cm. long and broad, 5-nerved at the base, scabrous-setose with stellate hairs

on both surfaces ; male panicles slender, up to 25 cm. long ; flowers small, clustered ; stamens 17–20 ; female panicles much smaller ; ovary densely setose ; capsule deeply trilobed, about 2·5 cm. long, rusty-tomentose .. .. *africanum*

M. africanum *Muell. Arg.*—F.T.A. 6, 1 : 818 ; Stapf 649 ; Holl. 4 : 596 ; Chev. Bot. 572.
Sierra Leone : ? locality ! Freetown, Hill Station (Dec.) ! Pujehun (Feb.) ! Liberia : Grand Bassa ! Monrovia ! Ivory Coast : Bouroukrou ! Tépos country, Grabo village ! Gold Coast : Akwapim Hills (Oct.) ! S. Nigeria : Benin (May) ! Oban ! Calabar R. (fr. Feb.) ! Obu ! Aguku ! Eket ! Also in French Cameroons, St. Thomas and Princes Islands, and extending to Congo and Angola. Exsicc.—*Mann* 2308. *Sc. Elliot* 5925. *Smythe* 204. *Johnson* 795. *Whyte. Farmar* 404. *Thomas* 455 ; 808. *Farquhar* 3. *Talb.* 3074 ; 3248. *Aylmer* 9. *Dinklage* 1758. (See Appendix).

32. MANIHOT Adans.—F.T.A. 6, 1 : 839.

Leaves peltate ; fruits without wings or ridges ; bracts small .. .. 1. *Glaziovii*
Leaves not peltate ; fruits with 6 distinct wings or ridges :
Bracts large and leafy, at first concealing the flowers :
Fruits dehiscent .. .. 2. *piauhyensis*
Fruits indehiscent .. .. 3. *Teissonnieri*
Bracts small, not longer than the pedicels :
Lobes of the leaves sometimes more or less lobulate, the middle lobe the longest with the midrib continued to the top, abruptly acuminate .. .. 4. *dichotoma*
Lobes of the leaves entire, the middle one the longest, the midrib continued to the top, gradually acuminate .. .. 5. *utilissima*
Lobes of the leaves entire, the middle one much smaller than the others or nearly completely reduced, the midrib divided at the rounded top .. 5. *utilissima* var. *hyptiaphylla*

1. **Manihot Glaziovii** *Muell. Arg.*—F.T.A. 6, 1 : 839 ; Holl. 4 : 598 ; Chev. Bot. 574. The Ceara rubber tree, native of Brazil, cultivated for rubber and planted as an ornamental tree.
2. **M. piauhyensis** *Ule*—F.T.A. 6, 1 : 840 ; Holl. 4 : 600. A shrub or small tree, Piauhy rubber, native of Brazil ; cultivated.
3. **M. Teissonnieri** *A. Chev.*—F.T.A. 6, 1 : 841 ; Chev. Bot. 574. Similar to the last ; cultivated in French West Africa.
4. **M. dichotoma** *Ule*—F.T.A. 6, 1 : 841 ; Holl. 4 : 597. The Jequié rubber tree, native of Brazil, cultivated as a rubber plant.
5. **M. utilissima** *Pohl*—F.T.A. 6, 1 : 842 ; Stapf 649 ; Holl. 4 : 600 ; Chev. Bot. 574. A shrub 6–10 ft. high, glabrous, with digitate leaves glaucous beneath, and tuberous roots ; very variable in colour of bark, tint of foliage, etc. Cassava, a cultivated food-plant, native of Brazil. (See Appendix).
Var. **hyptiaphylla** Prain. Dahomey : Savé. S. Nigeria : Ibadan ! Shokan ! Also in Shari region. Exsicc.—*Dudgeon. Johnson.*

33. TETRORCHIDIUM Poepp. & Endl. Nov. Gen. & Sp. 3 : 23, t. 227.—F.T.A. 6, 1 : 846, as *Hasskarlia* Baill.

Shrubs or trees :
Leaves of the ultimate branchlets alternate, oblong-elliptic to obovate, cuspidate-acuminate, cuneate at the base, 10–18 cm. long, up to 11 cm. broad, entire or denticulate ; male inflorescence leaf-opposed, glabrous, catkin-like, flowers crowded ; female flowers solitary or very few ; branchlets glabrous .. 1. *didymostemon*
Leaves of the ultimate branchlets opposite, rather elongate-oblong-elliptic, up to 16 cm. long and 8 cm. broad, often repand-dentate ; male inflorescences interpetiolar, shortly pubescent, the spike interrupted ; female flowers not seen ; branchlets pubescent .. .. 2. *oppositifolium*
Herb ; leaves opposite, the upper alternate, obovate to oblanceolate, long-acuminate, serrate in the upper half, about 3 cm. long and 1–1·5 cm. broad ; male spikes very short, leaf-opposed ; female flowers not known .. .. .. 3. *minus*

1. **Tetrorchidium didymostemon** *Pax & K. Hoffm.* in Engl. Pflanzenr. 4, 147 ; 14 : 53. *Hasskarlia didymostemon* Baill.—F.T.A. 6, 1 : 846 ; Stapf 649 ; Chev. Bot. 575. A shrub or a tree up to 80 ft. high with zigzag branchlets, pale yellowish-green foliage and slender yellow male flower-spikes.
In forest, etc., from French Guinea to Cameroons and extending to Angola, Uganda and Tanganyika. Exsicc.—*Heudelot* 835. *Barter* 1848. *Sc. Elliot* 4332 ; 4725 ; 5232 ; 5430 ; 5557. *Whyte. Talb.* (no number). *Mildbraed* 7227. (See Appendix).
2. **T. oppositifolium** *Pax & K. Hoffm.* l.c. *Hasskarlia oppositifolia* Pax—F.T.A. 6, 1 : 847 ; Chev. Bot. 576. A shrub or small tree like the preceding.
Liberia : Sino Basin ! Monrovia ! S. Nigeria : Oban ! Also in Gabon. Exsicc.—*Whyte. Talb.* 640 ; 664. *Dinklage* 2213.
3. **T. minus** *Pax & K. Hoffm.* l.c. *Hasskarlia minor* Prain—F.T.A. 6, 1 : 1055. A glabrous erect half-woody herb, 1–2 ft. high.
Sierra Leone : near Pendembu (Apr.) ! S. Nigeria : Degema ! Exsicc.—*Sc. Elliot* 5680. *Talb.* 3795.

34. ERYTHROCOCCA Benth.—F.T.A. 6, 1 : 847.

Branches armed with a pair of sharp stipular spines at the base of each leaf ; leaves ovate or oblong, acuminate, 4–5 cm. long, 2–3 cm. broad, faintly crenate, glabrous ; lateral nerves about 2 pairs ; male racemes very short and slender ; calyx globose in bud, glabrous ; stamens 6–11 ; fruits 1–3-lobed, sparingly setose .. 1. *anomala*
Branches not spiny :
Branchlets hairy :
Branchlets long-pilose with spreading hairs ; leaves very shortly petiolate, oblong-obovate, coarsely jagged-toothed, 5–15 cm. long, 1·5–5 cm. broad, membranous, pilose with stiff slender hairs on both surfaces ; stipules small and hyaline ; male

pedicels up to 1 cm. long; sepals glabrous; stamens about 27; stigmas recurved and closely appressed on the ovary .. .. 2. *membranacea*

Branchlets softly pubescent with spreading hairs; leaves shortly petiolate, ovate, denticulate, 3–5 cm. long, 2 cm. broad, pubescent beneath; male pedicels glabrous, up to 6 mm. long; sepals glabrous; stamens 30; disk-glands hirsute; stigmas short and suborbicular .. .. 3. *Chevalieri*

Branchlets shortly pubescent with appressed hairs; leaves ovate-oblong, long-acuminate, 13–20 cm. long, 4–5 cm. broad, distantly crenate-serrate, hispid below; stipules small and scale-like; male pedicels 6 mm. long; sepals glabrous; stamens about 27; female inflorescences few-flowered, about 5 cm. long, hispid; stigmas spreading .. .. 4. *hispida*

Branchlets glabrous:

Male buds ovoid, pointed; stigmas sessile, closely appressed on the ovary; leaves oblong-lanceolate, acuminate, 7–20 cm. long, 2·5–6 cm. broad, distantly serrulate, glabrous; male pedicels subumbellate, up to 1·5 cm. long; stamens 24–30 5. *Mannii*

Male buds rounded; stigmas usually suberect or spreading:

Stigmas erect, smooth, on a distinct style; leaves oblong to elliptic-obovate, 10–15 cm. long, 5–6 cm. broad, glabrous or nearly so below, remotely toothed; male pedicels slender, 1–2 cm. long; stamens 30 .. .. 6. *Welwitschiana*

Stigmas suborbicular, spreading, papillose; leaves ovate, 5–6·5 cm. long, 2·5–4 cm. broad, crenate, nearly glabrous; male pedicels up to 1 cm. long; stamens 24 7. *africana*

1. **Erythrococca anomala** *Prain* in Ann. Bot. 25 : 614. *E. aculeata* Benth.—F.T.A. 6, 1 : 858; Stapf 649; Chev. Bot. 575. A glabrous spiny shrub 3–8 ft. high; fruit (as in the other species) usually 2-lobed and splitting to expose the pitted spherical seeds enclosed in a thin scarlet aril.
Senegal: Boquet! French Guinea: Timbo. Sierra Leone: Freetown, Mt. Aureole (Mar.)! Bagroo R. (Apr.)! Wallia, Scarcies R. (Jan.)! Limba, Makunde (Apr.)! Liberia: Monrovia! Sino R.! Ivory Coast: several localities. S. Nigeria: Lagos Colony! Ibadan! Olokemeji! Oban! Victoria; Johann-Albrechtshöhe. Exsicc.—*Heudelot* 856. *T. Vogel* 162. *Mann* 879. *Sc. Elliot* 4790; 5694. *Whyte. Rowland. Schlechter* 13012. *Talb.* (no number). (See Appendix).
2. **E. membranacea** *Prain*—F.T.A. 6, 1 : 864. *Athroandra membranacea* Pax & K. Hoffm. A shrub 10 ft. high.
Cameroons Mt., 4,000 ft. (Feb.)! Buea! Exsicc.—*Mann* 1197. *Lehmbach* 212.
3. **E. Chevalieri** *Prain*—F.T.A. 6, 1 : 866; Chev. Bot. 575. *Athroandra Chevalieri* Pax & K. Hoffm. A shrub.
French Guinea: Futa Jallon, Labé Plateau (Apr.)! Diaguissa (Mar.). Konanké country, between Fassakoidou and Kesséridou (Feb.)! Dahomey: Savalou, between Cabolé and Bassila (May). Exsicc.—*Chev.* 12296; 12643; 12689.
4. **E. hispida** *Prain*—F.T.A. 6, 1 : 873. *Athroandra hispida* Pax & K. Hoffm. A shrub 6–8 ft. high, yellowish-hairy; fruit rather larger than in the other species, about ½ in. across.
Cameroons Mt., 5,300 ft.! Buea! Exsicc.—*Preuss. Mildbraed* 3459. *Dunlap* 19; 56; 98; 100.
5. **E. Mannii** *Prain*—F.T.A. 6, 1 : 865. *Athroandra Mannii* Pax & K. Hoffm. A shrub 15 ft. high.
Fernando Po: Clarence Peak, 5,000 ft. (Dec.)! Exsicc.—*Mann* 260; 633.
6. **E. Welwitschiana** *Prain*—F.T.A. 6, 1 : 868. *Athroandra Welwitschiana* Pax & K. Hoffm. A shrub 4–15 ft. high.
S. Nigeria: Oban! Also in French Cameroons, extending to Congo and Angola. Exsicc.—*Talb.* 663.
7. **E. africana** *Prain*—F.T.A. 6, 1 : 866; Stapf 649 (as *Claoxylon Barteri* Hook f.); Chev. Bot. 576 (as *Claoxylon africanum* Muell. Arg.). *Athroandra africana* Pax & K. Hoffm. A shrub or small tree with pale leaves, and slender, more or less pendulous, flower-racemes.
Senegal: Casamance R. Sierra Leone: Crawford's Island! Hills near Bafodeya (Apr.)! Liberia: Sino Basin! Ivory Coast: between Zaon and Ayame; Zaramou; Cavally Basin. Dahomey: Allada, Koussi. S. Nigeria: Lagos, Ikoyi (fl. Dec., fr. Mar.)! Epe! Yoruba forests! Lagos Colony! Ipetu! Exsicc.—*Perrottet* 748. *Afzelius. Barter* 2223; 3285; 3344. *Millen* 163. *Sc. Elliot* 5505. *Whyte. Chev.* 17631; 17805 ter; 19987; 23235.

35. CLAOXYLON A. Juss.—F.T.A. 6, 1 : 874.

Leaves long-cuneate at the base, elongate obovate-oblanceolate, 15–25 cm. long, 5–6·5 cm. broad, purplish when young, remotely denticulate, nearly glabrous below; male flowers in lax racemes; stamens 11–12 .. .. 1. *pedicellare*

Leaves rounded or very widely cuneate at the base, elliptic-obovate, 17–30 cm. long, 8–15 cm. broad, closely serrate, the petioles purplish when young; male flowers in rather close racemes resembling catkins when young; stamens 6–8 .. 2. *hexandrum*

1. **C. pedicellare** *Muell. Arg.*—F.T.A. 6, 1 : 874. *Discoclaoxylon pedicellare* Pax & K. Hoffm. A small tree with rather long-petioled leaves and green glabrous branchlets. Fernando Po! Exsicc.—*Mann.*
2. **C. hexandrum** *Muell. Arg.*—F.T.A. 6, 1 : 875. *Discoclaoxylon hexandrum* Pax & K. Hoffm. A tree 10–35 ft. high, like the last.
Ivory Coast: Yapo, in forest (Oct.)! S. Nigeria: Oban! Victoria to Bimbia! Cameroons Mt.: Buea, 3,300 ft.! Fernando Po (Jan.)! Also in French Cameroons and Belgian Congo. Exsicc.—*Mann* 186. *Talb.* 1352. *Chev.* B 22363. *Lehmbach* 184. *Preuss* 1328.

36. MICROCOCCA Benth.—F.T.A. 6, 1 : 876.

Annual herb; leaves ovate, acuminate, 2·5–5 cm. long, 1·5–2·5 cm. broad, obtusely crenate, glabrous or nearly so, sometimes purple-tinged; flowers monoecious, in slender axillary racemes 5–8 cm. long; male sepals 3; stamens usually 6, intermixed with staminal glands; female sepals 3–5; fruit deeply 3-lobed, strigose *mercurialis*

M. mercurialis *Benth.*—F.T.A. 6, 1 : 878; Chev. Bot. 576. A weed of cultivation, ½–2 ft. high, stems simple or branched, pubescent, woody below.
Throughout tropical Africa and also in Asia and Madagascar. Exsicc.—*Sc. Elliot* 4117. *T. Vogel* 194. *Barter* 1494. *Dalz.* 164; 785. *Dinklage* 1659. *Warnecke* 187. *Schlechter* 12394.

37. ACALYPHA L.—F.T.A. 6, 1 : 880.

Male and female flowers on separate inflorescences :

Female inflorescence paniculate, terminal ; stems pubescent ; leaves long-petiolate, ovate, subcordate at the base, acuminate, 4–9 cm. long, 2·5–7·5 cm. broad, coarsely crenate-serrate, 5-nerved at the base ; male racemes axillary, very slender, 6–13 cm. long .. .. 1. *paniculata*

Female inflorescence spicate :

Ovary with gland-tipped hairs ; stems very villous with reflexed hairs ; leaves linear-lanceolate, cordate at the base, 7–12 cm. long, 1·5–3 cm. broad, villous on both sides ; male racemes axillary, slender ; styles laciniate, purplish .. 2. *senensis* var. *chariensis*

Ovary without gland-tipped hairs :

Bracts of the female flowers with numerous gland-tipped hairs on the teeth or within :

Styles bilobed and not laciniate ; stems shortly pubescent ; leaves ovate, caudate-acuminate, crenate-serrate, 3–6 cm. long, 3–4 cm. broad, softly pubescent below ... ... 3. *nigritiana*

Styles laciniate ; stems softly pubescent and sometimes villous ; leaves ovate, caudate-acuminate, rounded or subcordate ; 5–11 cm. long, 3–6·5 cm. broad, rather coarsely serrate, spreadingly pilose on the nerves below ; male inflorescences axillary, very slender, 5 cm. or more long, female terminal, densely bracteate, 5–9 cm. long .. .. 4. *ornata*

Bracts of the female flowers without gland-tipped hairs ; stems at length nearly glabrous ; leaves long-petiolate, ovate or ovate-lanceolate, acutely acuminate, subcordate at the base, 4–10 cm. long, 2·5–6 cm. broad, sparingly setose on both surfaces ; female bracts deeply laciniate with about 20 unequal densely ciliate teeth .. .. 5. *Manniana*

Male and female flowers on the same inflorescences or in the same leaf-axil ; the males above the females :

Leaves provided with numerous raised resinous glands on the lower surfaces, ovate-rhomboid, cuneate at the base, 6-8 cm. long, 2-5–5 cm. broad, obtusely serrate ; inflorescence bisexual, axillary, the upper part male, with a few 2–flowered female bracts at the base enlarging in fruit and about 1·3 cm. broad 6. *ceraceopunctata*

Leaves without glands below :

Female bracts digitately 3-partite, with gland-tipped hairs on the margins ; leaves ovate, subcordate, 2–5 cm. long, 1·5–4 cm. broad, crenate, sparingly pubescent ; petiole as long as blade ; inflorescence very short, with 6–9 female flowers below 7. *brachystachya*

Female bracts dentate, fimbriate or laciniate with numerous teeth :

Female bracts fimbriate, ribbed, the teeth shortly ciliate ; leaves long-petiolate, ovate to rhomboid-ovate, 4–11 cm. long, 2–5 cm. broad, slightly scabrous, thin, crenate-serrate ; inflorescence axillary, with about 10 female flowers in the lower part 8. *ciliata*

Female bracts crenate or dentate :

Female bracts rather small, usually crowded and overlapping in the leaf-axils, dentate, conspicuously ciliate ; leaves ovate, obtuse or subacute, rounded at the base, 2–5 cm. long, 1·3–3 cm. broad, crenate, glabrous or nearly so ; inflorescence terminated by a cluster of abortive flowers .. .. .. 9. *crenata*

Female bracts large and foliaceous, very laxly arranged, crenate, ovate when spread out, often with a few gland-tipped hairs ; leaves ovate, 1·5–4 cm. long, 1–2·5 cm. broad, crenate, sparingly setulose ; inflorescence about 2 cm. long, with 2–4 female flowers remote from the male .. .. .. 10. *segetalis*

1. **Acalypha paniculata** *Miq.*—F.T.A. 6, 1 : 886 ; Chev. Bot. 577. An erect nettle-like herb, 2–5 ft. high, with a copious inflorescence of small flowers, often deep red in colour.
Ivory Coast : Bingerville. Gold Coast : Kumasi (Jan.) ! Abofuo (July) ! Togo : Kratchi ! S. Nigeria : Lagos ! Ambas Bay (Feb.) ! Obu ! Aguku ! Cameroons Mt. : 1,000 ft. (Dec.) ! Fernando Po (June) ! Also in French Cameroons and throughout tropical Africa and Asia. Exsicc.—*Barter* (no number). *Mann* 767 ; 1254. *Cummins* 20a. *Dawodu* 212.
2. **A. senensis** *Klotzsch*, var. **chariensis** Hutch.—F.T.A. 6, 1 : 888 ; Chev. Bot. 577. *A. senegalensis* Pax & K. Hoffm. (?). A hairy herb 2–3 ft. high, woody at the base, with red-purple flowers.
Senegal : Bucoy R. French Sudan : between Dioubéba and Gualia (Dec.). N. Nigeria : Yola (May) ! Panyam, 4,500 ft. (July) ! Also in French Cameroons, Ubangi-Shari and French Congo. Exsicc.—*Dalz.* 159. *Lely* 412. *Lecard* 45 and 301 (not seen).
3. **A. nigritiana** *Muell. Arg.*—F.T.A. 6, 1 : 890. A low undershrub.
S. Nigeria : Lagos ; Yoruba forests ! Exsicc.—*Barter* 3425.
4. **A. ornata** *Hochst.*—F.T.A. 6, 1 : 890. An undershrub up to 8 ft. high.
N. Nigeria : Tilde Fulani, 3,300 ft. (May) ! Lagos ! Ajilite, in forest ! Olokemeji ! Abo ! Extends to the Red Sea and common throughout tropical Africa. Exsicc. *Barter* 478 ; 618. *Millen* 20 ; 113 ; 135 ; 176. *Foster* 288. *Lely* 230.
The plant enumerated by Chevalier (Bot. 576) as *A. Manniana* Muell. Arg. probably belongs here (French Guinea : Futa-Jallon, *Chev.* 18652).
5. **A. Manniana** *Muell. Arg.*—F.T.A. 6, 1 : 893. Stems herbaceous, about 6 ft. high.
Cameroons Mt., 9,000 ft. (Feb.) ! Buea. Also in French Cameroons. Exsicc.—*Mann* 1270.

6. **A. ceraceopunctata** *Pax*—F.T.A. 6, 1 : 896. A herb or undershrub 3–4 ft. high ; foliage yellow-green when dry ; fruit hidden by the enlarged pale bracts, 3-lobed and dotted with yellow scale-like glands.
N. Nigeria : Katagum (fr. Sept.) ! Yola (June) ! Also in French Cameroons. Exsicc.—*Dalz.* 151 ; 209.
7. **A. brachystachya** *Hornem.*—F.T.A. 6, 1 : 899. A small slender-branched annual 6–12 in. high.
Cameroons Mt. : Buea ! French Cameroons to Red Sea, Abyssinia, Uganda, Congo, Angola and East Africa ; also in India and Java. Exsicc.—*Lehmbach* 190. *Preuss* 1002.
8. **A. ciliata** *Forsk.*—F.T.A. 6, 1 : 901 ; Chev. Bot. 576–577, as *A. fimbriata* Sch. & Thonn. and *A. Vahliana* Muell. Arg. An erect, slightly pubescent branched annual, 2½ ft. high.
Throughout tropical Africa ; also in Cape Verde Islands, Arabia and India. Exsicc.—*Roger* 54. *Heudelot. Richard. T. Vogel* 181. *Barter* 1047, *Brown* 414. *Farmar* 466. *Warnecke* 368.
9. **A. crenata** *Hochst.*—F.T.A. 6, 1 : 903. An annual 1–1½ ft. high ; stem pubescent, channelled or compressed.
N. Nigeria : Lokoja ! Nabardo, 2,300 ft. (May) ! Vom ! Also in Cameroons and extending to Abyssinia, Eastern Sudan, Somaliland and Uganda. Exsicc.—*Barter* (no number). *Ansell. Lely* 214. *Dent Young* 225.
10. **A. segetalis** *Muell. Arg.*—F.T.A. 6, 1 : 904. A small spreading annual 6–12 in. high ; stem and branches channelled, pubescent ; a weed of cultivation.
Togo : Misahöhe ! Dahomey ! N. Nigeria : Nupe ! Lokoja (Nov.) ! Aguji ! Keana, Nassarawa (July) ! S. Nigeria : Lagos ! Also in French Cameroons, Congo, Angola, S.W. and E. Africa to Rhodesia and Eastern South Africa. Exsicc.—*Barter* 1490 ; 1495. *Millen* 37. *Baumann* 227.

38. MAREYA Baill.—F.T.A. 6, 1 : 910.

Flowers green, monoecious ; leaves nearly or quite glabrous beneath, oblong-elliptic to obovate, abruptly shortly acuminate, 10–17 cm. long, 4–6·5 cm. broad, slightly toothed ; spikes slender .. .. 1. *micrantha*

Flowers white, monoecious ; leaves usually with spreading hairs on the nerves beneath, oblong to oblanceolate, 10–20 cm. long, 4–8 cm. broad, coarsely toothed ; spikes stiffer .. .. 2. *spicata*

1. **M. micrantha** *Muell. Arg.*—F.T.A. 6, 1 : 911 ; Chev. Bot. 577. A shrub or small tree sometimes 20–25 ft. high, with puberulous branchlets and rather numerous long slender flower-spikes.
French Guinea : Koulikoro ; Kissidougou. Ivory Coast : Bouroukrou ; Sassandra Port ; Middle Comoe, Assikasso (Dec.) ! S. Nigeria : Oban ! Johann-Albrechtshöhe ! near Victoria ! Fernando Po (June, Jan., Nov.) ! Also in French Cameroons, Spanish Guinea and Gabon. Exsicc.—*T. Vogel* 210. *Mann* 209 ; 235 ; 435. *Preuss* 1376.
2. **M. spicata** *Baill.*—F.T.A. 6, 1 : 911 ; Chev. Bot. 577. A tree reaching 50 ft., with pubescent branchlets.
Senegal ! French Guinea : Kouria and neighbourhood (Nov.) ! Konakry ! Futa Jallon, between Ymbo and Kouria ! Sierra Leone—Liberia : various localities, common ! Gold Coast : Koforidua (Dec.) ! Kibbi (Jan.) ! Obuasi (Jan.) ! Togo : Misahöhe (Nov.) ! S. Nigeria : Victoria ! Fernando Po ; Goderich Bay (Dec.) ! Also in Congo Basin. Exsicc.—*Heudelot* 752. *T. Vogel* 137. *Barter* (no number). *Winwood Reade. Sc. Elliot* 4158 ; 4697 ; 5055. *Whyte. Johnson* 447. *Daniell. Preuss* 1319. *Mildbraed* 7295. (See Appendix).

39. LEPIDOTURUS Baill.—F.T.A. 6, 1 : 913.

Branchlets and young leaves purplish ; leaves ovate-elliptic, acutely acuminate, rounded and with a pair of stipel-like processes at the base, 8–13 cm. long, 3–5 cm. broad, crenate, pilose on the nerves below ; flowers dioecious, apetalous ; male spikes slender, from perulate buds on the 1-year-old shoots ; stamens 8 ; female spikes on the young shoots, flowers very few ; styles 3, slender .. .. .. *laxiflorus*

L. laxiflorus *Benth.*—F.T.A. 6, 1 : 913 ; Holl. 4 : 606. *Alchornea laxiflora* Pax & K. Hoffm. A shrub or small tree 15–20 ft. high, with leaves 3-nerved at the base.
N. Nigeria : Naraguta ! S. Nigeria : Lagos Colony, common in Yoruba forests ! Ikirun (Feb.) ! Benin ! Also in French Cameroons and extending to Congo, Nile Land, Uganda and East Africa. Exsicc. —*Barter* 3342. *Millson* 42 ; 135. *Rowland. Unwin* 39. *Hill* 33. (See Appendix).

40. ALCHORNEA Sw.—F.T.A. 6, 1 : 914.

Ovary 2-celled ; inflorescences always lateral ; leaves long-petiolate, broadly ovate, cordate at the base, 10–25 cm. long, 7·5–15 cm. broad, repand-dentate or subentire, with a gland in the axil of each nerve at the base, finely stellate-puberulous or glabrescent below ; male spikes in copious axillary panicles ; styles 2 ; fruits puberulous 1. *cordifolia*

Ovary 3-4-celled ; leaves very shortly petiolate, not or scarcely cordate at the base :

Leaves elongate-obovate-oblanceolate, very shortly petiolate, long-attenuated to the base, 15–30 cm. long, 6–11 cm. broad, repand-denticulate, with 2 or more glands at the base, glabrous, with about 12 or more pairs of lateral nerves ; male spikes paniculate ; styles 3 ; capsule smooth .. .. 2. *floribunda*

Leaves oblong-elliptic, distinctly petiolate, rounded at the base, 7–13 cm. long, 2·5–6 cm. broad, entire or crenate, with a pair of glands at the base below, slightly hairy on the midrib below, with 7–10 pairs of lateral nerves ; styles 3 ; capsule tuberculate 3. *hirtella*

1. **Alchornea cordifolia** *Muell. Arg.*—F.T.A. 6, 1 : 915 ; Stapf 650 ; Holl. 4, 1 : 607 (as *A. cordata* Benth.) ; Chev. Bot. 577. A shrub or small tree, erect or half climbing ; flowers greenish-white, fruit 2-celled, ¼ in. wide, grey-pubescent in lax pendulous spikes.
Common throughout the area in forest and evergreen fringes ; extending to Eastern Sudan, Uganda, East Africa, Congo and Angola. (See Appendix).
2. **A. floribunda** *Muell. Arg.*—F.T.A. 6, 1 : 916 ; Chev. Bot. 578, partly. A shrub or tree up to about 30 ft. high, with glabrous branchlets.
French Sudan : Moussaia. Ivory Coast : various localities. S. Nigeria : Benin ! Oban ! Eket ! Cameroons Mt. : Buea ! Fernando Po ! Also in French Cameroons and extending to Congo Basin. Exsicc —*Mann* 306. *Dennett* 6. *Talb.* 3284. (See Appendix).

3. **A. hirtella** *Benth.*—F.T.A. 6, 1 : 917 ; Stapf 649 ; Chev. Bot. 579. A shrub with hairy branchlets ; young leaves often purple ; flowers in numerous slender spikes, whitish, sometimes reddish.
French Sudan : Banancoro ! French Guinea : Rio Nunez ! and other localities ! Sierra Leone : River Pungas ! Scarcies R. ! Njala (Feb., Sept.) ! Liberia : Grand Bassa ! Ivory Coast : R. Comoe, between Alépé and Malamalasso ; Dyola country, Danané. S. Nigeria : Victoria ! Also in Gabon and Belgian Congo. Exsicc.—*Heudelot* 746. *Afzelius. Sc. Elliot* 4230 ; 4629 ; 4714. *T. Vogel* 35. *Farmar* 206. *Deighton* 521 ; 2131. *Chev.* 499. *Winkler* 664. (See Appendix).

41. NEOBOUTONIA Muell. Arg.—F.T.A. 6, 1 : 918.

Pubescence or scurf not continuous over the lower surface of the leaves :
Leaves with long soft spreading hairs as well as scurf on the nerves below ; male calyx pubescent :
Twigs and male panicles softly hairy with long simple hairs ; leaves orbicular-cordate, crenate, 13–15 cm. long and broad .. .. 1. *diaguissensis*
Twigs and male panicles only scurfy-stellate-puberulous ; leaves orbicular-cordate, entire, 10–20 cm. long and broad ; styles narrow, with 2 linear lobes 2. *Mannii*
Leaves without long hairs below ; male calyx glabrous ; leaf-blade suborbicular, shallowly cordate, 10–20 cm. long and broad ; styles narrow, with 2 linear lobes 3. *glabrescens*
Pubescence or scurf continuous and felted over the whole under-surface of the leaves ; male calyx hairy ; leaves orbicular-cordate, 10–20 cm. long and broad, entire, softly hairy on the nerves above ; styles narrow, with 2 linear lobes ; ovary and capsule densely velvety .. .. 4. *velutina*

1. **Neoboutonia diaguissensis** *Beille*—F.T.A. 6, 1 : 920 ; Chev. Bot. 579. *N. africana* var. *diaguissensis* Pax & K. Hoffm. A small tree.
French Guinea : high plateau of Diaguissa (Apr.) ! Labé ; Ditinn ; Dalaba ; Toukan to Bouria. Exsicc. —*Chev.* 12691.
2. **N. Mannii** *Benth.*—F.T.A. 6, 1 : 920. *N. africana* var. *Mannii* Pax & K. Hoffm. A tree 20–35 ft. high.
Cameroons Mt. : Buea, 3,300 ft. ! Also in French Cameroons and Princes Island. Exsicc. *Deistel* 643.
3. **N. glabrescens** *Prain*—F.T.A. 6, 1 : 921. *N. africana* var. *glabrescens* Pax & K. Hoffm. A shrub 12–15 ft. high, with stellate-scurfy branchlets and flower panicles.
S. Nigeria : Bimbia ! Also in French Cameroons and Spanish Guinea. Exsicc.—*Preuss* 1288.
4. **N. velutina** *Prain*—F.T.A. 6, 1 : 921. *N. Melleri* var. *velutina* Pax & K. Hoffm. A shrub or small tree, 15–20 ft. high, with stellate-scurfy branchlets and flower panicles.
S. Nigeria : Bamenda, 5,500 ft. ! Also in French Cameroons. Exsicc.—*Ledermann* 1924.

42. NECEPSIA Prain—F.T.A. 6, 1 : 923.

Leaves obovate-elliptic, acutely acuminate, widely cuneate at the base, 10–25 cm. long, 6–9 cm. broad, glabrous, remotely denticulate ; lateral nerves about 10 pairs, with distinct parallel tertiary nerves ; flowers monoecious, apetalous ; spikes solitary, slender, about as long as the leaves ; bracts clustered, persistent ; stamens numerous, with pubescent glands between ; styles fimbriate-papillose .. .. .. *Afzelii*

N. Afzelii *Prain*—F.T.A. 6, 1 : 923. A tree with branchlets yellowish-pubescent becoming glabrous.
Sierra Leone : ? locality. Also in French Cameroons. Exsicc.—*Afzelius* 29.

43. CROTONOGYNOPSIS Pax—F.T.A. 6, 1 : 924.

Leaves crowded, sessile, elongate-oblanceolate, much narrowed to and auriculate-cordate at the base, about 30 cm. long and up to 8 cm. broad, rather coarsely dentate, glabrous ; lateral nerves numerous ; flowers dioecious, apetalous ; male racemes fascicled on the old wood ; pedicels pubescent, jointed above the base ; calyx glabrous ; stamens 12–15 ; female calyx ciliate ; styles with laciniate tips *usambarica*

C. usambarica *Pax*—F.T.A. 6, 1 : 924. A shrub or small tree 12–30 ft. high, with yellowish bark.
Cameroons Mt. : Buea. An East African species. Exsicc.—*Deistel* 218 (not seen).

44. ARGOMUELLERA Pax—F.T.A. 6, 1 : 925.

Branchlets softly tomentose ; leaves obovate-oblanceolate, acute, 20–40 cm. long, 5–13 cm. broad, sharply serrate, villous on the midrib and nerves below ; lateral nerves numerous ; racemes axillary, up to 20 cm. long ; flowers monoecious, apetalous ; male calyx splitting into 3–4 valvate segments ; stamens numerous, mixed with glands ; female sepals 5–6, imbricate ; ovary densely pubescent ; styles recurved, nearly free or shortly connate .. .. *macrophylla*

A. macrophylla *Pax* F.T.A. 6, 1 : 925. *Pycnocoma Hutchinsonii* Beille ; Chev. Bot. 582, name only. *P. Sassandrae* Beille l.c., name only. A shrub 6–12 ft. high.
Sierra Leone : Tiama (Jan.) ! Ivory Coast : Zaranou ; Indénie ; between Mbosso and Zaranou. Morénou (Dec.) ! Also in Spanish Guinea, Congo, Angola, Uganda and East Africa. Exsicc.—*Chev.* 17600 ; 17634 ; 22505. *Dalz.* 8103.

45. MALLOTUS Lour.—F.T.A. 6, 1 : 927.

Leaves not glandular below ; stipules persistent, rigid-subulate ; fruit bristly ; leaf-blades ovate or ovate-elliptic, rounded or subcordate at the base, acuminate, 10–18 cm. long, 8–10 cm. broad, entire .. .. 1. *subulatus*

Leaves glandular below ; stipules small, caducous ; fruits smooth ; leaf-blades broadly ovate, rounded to quite cordate at the base, up to 18 cm. long and 10 cm. broad, toothed, glabrescent or pubescent below .. .. 2. *oppositifolius*

1. **Mallotus subulatus** *Muell. Arg.*—F.T.A. 6, 1 : 927 ; Chev. Bot. 580. A shrub 6–15 ft. high, with stellate-pubescent branchlets and flower racemes.
Ivory Coast : Aboisso. Gold Coast : Axim (Dec.) ! S. Nigeria : Benin ! Bonny (June) ! Aguku ! Oban ! Calabar ! Cross R. ! Bimbia. Victoria. Fernando Po ! Also in French Cameroons, Gabon, Ubangi and Congo Basin. Exsicc.—*T. Vogel* 191. *Mann* 260. *Unwin* 38. *Chipp* 50. *Talb.* 1311. *Thomas* 123 ; 1649 ; 2074 ; 2075. (See Appendix).
2. **M. oppositifolius** *Muell. Arg.*—F.T.A. 6, 1 : 928 (incl. vars. *pubescens* Pax and *glabrata* Muell. Arg.) ; Chev. Bot. 579. *M. Beillei* A. Chev. Bot. 579, name only. A shrub 6–12 ft. high : branchlets often purple, stellate-pubescent, becoming glabrous ; flowers creamy white, in yellow- or rusty-pubescent racemes.
Fairly common from Sierra Leone to Cameroons, extending to Congo and Angola, Nile Land, Uganda and East Africa ; also in Madagascar. (See Appendix).

46. CLEIDION Blume—F.T.A. 6, 1 : 930.

Leaves shortly petiolate, oblong-obovate, narrowed to the base, 10–17 cm. long, 4–6·5 cm. broad, crenate, glabrous ; male spikes simple ; flowers clustered, sessile *gabonicum*

C. **gabonicum** *Baill.*—F.T.A. 6, 1 : 930. A dioecious shrub or a tree reaching about 50 ft., with slightly pubescent branchlets and male inflorescences several inches long.
Gold Coast : Dansu River (Dec.) ! Kumasi (Mar.) ! West Ashanti, Tappa (Feb.) ! Also in Gabon Exsicc.—*Johnson* 437. *Chipp* 101 ; 141. (See Appendix).

47. DISCOGLYPREMNA Prain—F.T.A. 6, 1 : 931.

Leaves long-petiolate, broadly elliptic or suborbicular, rounded or broadly cuneate at the base, shortly and abruptly acuminate, 7–15 cm. long, 5–10 cm. broad, 3-nerved at the base, prominently nervose ; racemes paniculate, terminal, up to 20 cm. long, shortly pubescent ; stamens 7–8, mixed with hirsute glands ; fruits deeply 3-lobed, rather fleshy, slightly hairy .. .. *caloneura*

D. **caloneura** *Prain*—F.T.A. 6, 1 : 932 ; Chev. Bot. 587. A tree 50–70 ft. high, with glabrous branchlets, cylindrical stem and red, bitter fruit.
French Guinea : Guerzé country, between Moussadougou and Lola (fr. Mar.) ! Ivory Coast : Morénou (fr. Dec.) ! Potou Lagoon, at Anyama. Gold Coast : Ancobra R. (Dec.) ! West Ashanti, Esubompang (Feb.) ! S. Nigeria : 70 miles east of Lagos ! Also in French Cameroons and Spanish Guinea. Exsicc.—*Johnson* 919. *Chipp* 100. *Lamborn* 123. *Chev.* 20972 ; 22531.

48. MACARANGA Thouars—F.T.A. 6, 1 : 932.

Leaves more or less distinctly digitately lobed :
Leaves openly cordate at the base ; lobes fairly large :
Leaves shallowly 3-lobed, lobes very shortly acuminate, 13–30 cm. long and nearly as broad, gland-dotted below ; tertiary nerves numerous, parallel and very conspicuous ; stipules large, up to 5 cm. long ; bracts toothed .. .. 1. *rosea*
Leaves deeply 5-7-lobed (rarely 3-lobed), lobes long-acuminate, up to 30 cm. long and broad, gland-dotted below ; tertiary nerves few ; stipules about 3 cm. long ; bracts laciniate .. .. 2. *heterophylla*
Leaves overlapping-cordate ; lobes 3, very small and tooth-like ; leaf-blades suborbicular, up to 30 cm. long and broad, gland-dotted below ; tertiary nerves very numerous and parallel ; stipules about 2 cm. long, tomentose ; bracts rather deeply toothed .. .. 3. *occidentalis*
Leaves not lobed :
Leaves more or less toothed :
Stipules more or less persistent, 2·5 cm. long or more ; bracts obtuse :
Bracts deeply laciniate ; segments linear ; leaves ovate, acuminate, rounded at the base, 10–15 cm. long, 7–10 cm. broad, undulate-toothed, membranous, glabrous or nearly so, glandular ; petiole slender, 7–10 cm. long ; stamens 2 4. *Beillei*
Bracts crenate ; segments obtuse ; leaves broadly ovate, long-acuminate, rounded at the base, 10–20 cm. long, 7–10 cm. broad, coarsely toothed, slightly pubescent below and densely glandular ; petiole up to 15 cm. long ; stamens 1–2 5. *Paxii*
Stipules caducous, 1 cm. or less long ; bracts acute, serrate :
Leaves with long white hairs on the midrib below, very densely glandular, broadly ovate, shortly acuminate, rounded or truncate at the base, 13–18 cm. long, up to 15 cm. broad, repand-dentate ; petiole up to 17 cm. long ; stamens 2 ; fruits globose, about 3 mm. diam., waxy-glandular .. .. .. 6. *huraefolia*
Leaves glabrous or with very short hairs on the midrib below :
Midrib hairy below ; blade very conspicuously glandular below, broadly ovate or elliptic, widely cuneate or subtruncate at the base, 10–13 cm. long, up to 9 cm. broad, with rather numerous repand teeth ; petiole 8–15 cm. long ; stamen 1 ; fruit covered with golden scales .. .. 7. *monandra*
Midrib glabrous below ; blade rather obscurely glandular below, oblong-elliptic to obovate, widely cuneate, 10–17 cm. long, up to 13 cm. broad, with very few teeth; petiole up to 15 cm. long ; stamens 2 ; fruits rusty-scaly 8. *Zenkeri*

Leaves entire or at most undulate :
Bracts large and conspicuous :
Leaves auriculate-glandular at the base, elliptic-obovate, shortly acuminate, broadly cuneate, 10–16 cm. long, 5–7·5 cm. broad, minutely and closely glandular below ; petiole 6–10 cm. long ; stamens 2 ; bracts acuminate .. .. 9. *Barteri*
Leaves not auriculate at the base, oblong-oblanceolate, acutely acuminate, cuneate at the base, 7–10 cm. long, 4–5 cm. broad, minutely and closely glandular below ; petiole up to 4 cm. long ; stamens 2 ; bracts abruptly acuminate 10. *Rowlandii*
Bracts small and inconspicuous :
Leaves elliptic-oblong, with petiole about ½ as long, fairly long-acuminate, rounded at the base, 10–13 cm. long, 5–6·5 cm. broad, densely gland-dotted below ; stamens 2–3 .. .. 11. *spinosa*
Leaves oblong-oblanceolate, very shortly petiolate, abruptly mucronate-acuminate, obtuse at the base, 8–13 cm. long, 1·5–5 cm. broad, more laxly glandular below ; stamens 3–5 .. .. 12. *Heudelotii*

1. **Macaranga rosea** *Pax*—F.T.A. 6, 1 : 935. *M. Schweinfurthii* Pax, partly. A tree with stout glabrous branchlets sometimes armed with spines ; male panicles fasciculed in the axils of fallen leaves.
S. Nigeria : Oban ! Also in French Cameroons, Angola and Belgian Congo. Exsicc.—*Talb.* 112 ; 1377 ; 1431.
2. **M. heterophylla** *Muell. Arg.*—F.T.A. 6, 1 : 936 ; Chev. Bot. 580. A shrub or tree 12–20 ft. high ; branchlets armed with spines, rusty-pubescent when young ; flowers in axillary panicles, pink-tinged ; fruit red, half succulent, bilobed, ¼–⅓ in. diam.
Senegal : Casamance. French Guinea : Futa Jallon, between Santa R. and Timbo ; Kouria, near Konkouré R. ; Mamou. Sierra Leone : Sugarloaf Mt. ! Heddle's Farm ! Scarcies R., Buyabuya (fr. Feb.) ! Liberia : Reppue Town (Aug.) ! Ivory Coast : Abidjean, Dabou ; Agniéby Valley ; Agboville. Gold Coast : Kumasi ! W. Apollonia, Ankassa (Aug.) ! Cape Coast, Foso (Sept.) ! Anyinam (fr. Jan.) ! Exsicc.—*Don. Barter* (no number). *Sc. Elliot* 3835 ; 4767. *Cummins* 132. *Lane-Poole* 359. *Chipp* 326 ; 568. *Brent* 401. *Linder* 363.
3. **M. occidentalis** *Muell. Arg.*—F.T.A. 6, 1 : 936. A tree 30–60 ft. high, with stout rusty-pubescent branchlets ; male flowers crowded in axillary panicles.
S. Nigeria : Oban ! Ambas Bay (Feb.) ! Cameroons Mt., Buea, etc., 2,000–3,300 ft. (Dec., Jan.) ! Fernando Po, 4,000 ft. ! Exsicc.—*Mann* 303 ; 771 ; 1189 ; 2155. *Deistel* 627. *Dalz.* 8192. *Dunlap* 22.
4. **M. Beillei** *Prain*—F.T.A. 6, 1 : 939 ; Chev. Bot. 580. A glabrous shrub or small tree 10–15 ft. high ; male flowers in lax lateral panicles ; fruit red.
Ivory Coast : Bingerville, Abidjean, Dabou ! Agniéby Valley, Accrédiou. Exsicc.—*Chev.* 15551.
5. **M. Paxii** *Prain*—F.T.A. 6, 1 : 939. A shrub or small tree ; branchlets glabrous, sparingly armed with spines ; male flowers in lateral panicles.
S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Talb.* 610.
6. **M. huraefolia** *Beille* in Bull. Soc. Bot. Fr. 55, Mém. 8B : 80. *M. togoensis* Pax—F.T.A. 6, 1 : 939 ; Chev. Bot. 581. A tree 15–25 ft. high or sometimes a half-climbing shrub ; branchlets pubescent, armed with spines ; flowers in rather short axillary racemes or panicles ; fruit pisiform, covered with yellowish gland-scales.
Sierra Leone : Scarcies R., Sasseni, in forest (Jan.) ! Liberia : Gbanga (fr. Sept.) ! Du River (July) ! Ivory Coast : Bingerville, Abidjean, Dabou ; Guidéko ; Bouroukrou ; between Montézo and Alépé. Gold Coast : Ashanti, Boankro (May) ! Bataba, N. Beyin (July) ! Togo : Misahöhe (Nov.) ! S. Nigeria : Oban ! Exsicc.—*Sc. Elliot* 4530. *Chipp* 266 ; 440. *Thomas* 2186. *Mildbraed* 7258. *Linder* 73 ; 498.
7. **M. monandra** *Muell. Arg.*—F.T.A. 6, 1 : 940. A shrub or tree up to 25 ft. high, with rusty-pubescent branchlets ; flowers in small lateral racemes or panicles.
Sierra Leone : Bandajuma (May) ! Gold Coast : W. Apollonia, Amokokrom (Aug.) ! Also in Lower Congo, Angola and Uganda. Exsicc.—*Aylmer* 71. *Chipp* 317.
8. **M. Zenkeri** *Pax*—F.T.A. 6, 1 : 940. A glabrous tree ; flowers in small lateral racemes or panicles.
S. Nigeria : Calabar (fr. Mar.) ! Oban ! Also in French Cameroons, Gabon, Congo and Tanganyika. Exsicc.—*Holl.* 99.
9. **M. Barteri** *Muell. Arg.*—F.T.A. 6, 1 : 942 ; Chev. Bot. 580. A tree up to 40–50 ft. high ; branchlets glabrous, armed with spines ; flowers in axillary racemes or panicles ; fruits obliquely ovoid, 0·5 cm. diam., glandular.
Sierra Leone : Limba, near Bumban (Apr.) ! ? locality (on farm lands) ! Liberia : Bonuta (fr. Oct.) ! Ivory Coast : Bingerville, Abidjean, Dabou ; Zaranou ; Bouroukrou ! Gold Coast : Aburi Hills (Nov.) ! Akwapim Hills (June) : Togo : ? locality. S. Nigeria : Lagos ! Ijuwoye (Dec.) ! Onitsha ! Cross River ! Also in Spanish Guinea. Exsicc.—*Barter* 1654. *Sc. Elliot* 5668. *Johnston*, *Millen* 28 ; 125. *Johnson* 296 ; 748. *Lane-Poole* 231. *Chev.* 16830. *Linder* 889. (See Appendix).
10. **M. Rowlandii** *Prain*—F.T.A. 6, 1 : 942. A small glabrous tree ; flowers in small lateral panicles.
Gold Coast : ? locality ! Lagos Colony ! Exsicc.—*Rowland. Farmar* 454.
11. **M. spinosa** *Muell. Arg.*—F.T.A. 6, 1 : 944. A shrub or tree reaching 40 ft. ; branchlets armed with spines, pubescent ; flowers in small axillary panicles.
Fernando Po ! Also in French Cameroons, Spanish Guinea, French Congo and Angola. Exsicc.—*Mann* 1160.
12. **M. Heudelotii** *Baill.*—F.T.A. 6, 1 : 945 ; Chev. Bot. 581. A tree up to 40 ft. or more ; sometimes a half-scrambling shrub ; branchlets pubescent, armed with spines ; flowers axillary, the male in spikes, the female in panicles ; fruit pisiform covered with yellow scales.
Senegal : Cape Verde ; Kombe ; Dagana. French Guinea : Medinani (on the Upper Niger) ; Rio Nunez ; Kindia (Mar.) ! Kouria. Sierra Leone : Scarcies R. (Dec.–Mar.) ! Konnoh country ! Bonthe (Feb.) ! Ivory Coast : Dabou (Feb.) ! Zaranou (Mar.) ! Lower Cavally, between Prolo and Bliéron ! S. Nigeria : near Lagos ! Epe ! Exsicc.—*Barter* 3271. *Moloney*. *Sc. Elliot* 4390 ; 4517 ; 4743 ; 4958 ; 5258 ; 5275. (See Appendix).

49. RICINUS Linn.—F.T.A. 6, 1 : 945.

Leaves alternate, long-petiolate, orbicular in outline, peltate, up to 60 cm. broad, deeply palmately lobed ; lobes 7 or more, glandular-toothed, glaucous, glabrous, green or reddish ; stipules large, ovate, connate into a sheath and enclosing the bud ; flowers in large panicles, the males below, the females above ; capsule smooth or prickly, about 2·5 cm. diam. ; seeds mottled .. .. *communis*

M. communis *Linn.*—F.T.A. 6, 1 : 945. The common castor-oil plant, widely cultivated and very variable ; several varieties are distinguished with variously prickly fruits. (See Appendix).

50. TETRACARPIDIUM Pax & K. Hoffm. in Engl. Bot. Jahrb. 26 : 329 (1899). *Angostylidium* Pax & K. Hoffm. in Engl. Pflanzenr. 4, 147 : 17 (1919).—F.T.A. 6, 1 : 949, as *Plukenetia* Linn.

Leaves ovate, abruptly acuminate, rounded at the base, about 10 cm. long, 4·5–5 cm. broad, crenulate, 3-nerved at the base, glabrous ; petiole up to 5 cm. long ; male flowers in narrow raceme-like panicles about as long as the leaves, with 1–2 females near the base ; pedicels jointed above the base ; sepals glabrous ; stamens about 40 ; style very stout, at length quadrangular, with 4 spreading stigmas ; ovary 4-lobed ; capsule about 7 cm. across, 4-winged, ridged between the wings .. *conophorum*

T. conophorum *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Plukenetia conophora* Muell. Arg.—F.T.A. 6, 1 : 949 ; Holl. 4 : 611 ; Chev. Bot. 582. *Mallotus Preussii* Pax. *Tetracarpidium Staudtii* Pax. *Cleidion Preussii* Bak.—F.T.A. 6, 1 : 931. A climbing shrub 10–20 ft. long, glabrous ; male flowers deciduous, leaving the females at the base of the raceme.

Sierra Leone : ? locality ! Dahomey : Saketé (Jan.) ! S. Nigeria : Lagos Colony ! Modakeke ! Oban ! Aguku ! Awka ! Cameroons R. (Jan.) ! Barombi ! Johann-Albrechtshöhe ! Fernando Po, Clarence Peak. Also in French Cameroons, Spanish Guinea, Gabon and Belgian Congo. Exsicc.—*Mann* 2202. *Sc. Elliot* 4118. *Foster* 205. *Talb.* 615 ; 1371 ; 1384. *Thomas* 888 ; 1997 ; 2072. (See Appendix).

51. PYCNOCOMA Benth.—F.T.A. 6, 1 : 955.

Styles connate nearly to the top ; leaves oblanceolate, narrowed into a distinct petiole, acute, 20–40 cm. long, 3–8 cm. broad, remotely denticulate in the upper part, glabrous, strongly reticulate ; bracts lanceolate, acuminate, spreading or recurved, about 6 mm. long, shortly pubescent ; male pedicels up to 2 cm. long, 1–3 to each bract 1. *angustifolia*

Styles connate only in the lower third ; bracts concave, not recurved :

Rhachis of inflorescence slightly pubescent or glabrescent ; leaves elongate-oblanceolate, narrowed into a winged petiole at the base, acutely acuminate, up to 50 cm. long and 11 cm. broad, glabrous, laxly reticulate ; bracts broadly ovate-rounded, shortly appressed-pubescent ; male pedicels up to 2 cm. long ; fruits shortly horned 2. *macrophylla*

Rhachis of inflorescence rather densely pubescent ; leaves obovate-oblanceolate, gradually narrowed to the base, rather long-acuminate, up to 45 cm. long and 10 cm. broad, rather closely reticulate ; bracts broadly ovate, villous ; male pedicels up to 2 cm. long, 1–3 to each bract ; fruits with large horn-like wings .. 3. *cornuta*

1. **Pycnocoma angustifolia** *Prain*—F.T.A. 6, 1 : 960. *P. Beillei* A. Chev., name only. A shrub, glabrous except on the inflorescence, the leaves clustered towards the ends of the branchlets ; racemes peduncled in the upper axils ; capsule (young) velvety, at length glabrous, 4 cm. diam., each lobe with a pair of wing-like horns ; often in forest undergrowth.

Liberia : Kakatown ! Begwai (Sept.) ! Grand Bassa. Ivory Coast : in forest between Middle Sassandra and Middle Cavally ! Sassandra Basin, between Davo and Boutoubré ! Alépé ! Middle Cavally, Kééta ! Exsicc.—*Whyte. Bunting. Chev.* 16333 ; 17904 ; 19269 ; 19331.

2. **P. macrophylla** *Benth.*—F.T.A. 6, 1 : 959 ; Holl. 4 : 611 ; Chev. Bot. 582. *Wetriaria macrophylla* Pax. A shrub about 8 ft. high with long leaves clustered at the ends of the soft branchlets ; capsule 3-lobed, velvety, with 6 horn-like wings.

Ivory Coast : Attié, between Yacassé and Adzopé. Gold Coast : Ashanti, Banka Reserve (Dec.) ! S. Nigeria : Oban ! Fernando Po ! Also in French Cameroons and Belgian Congo. Exsicc.—*T. Vogel* 18. *Talb.* 691. *Chipp* 604. (See Appendix).

3. **P. cornuta** *Muell. Arg.*—F.T.A. 6, 1 : 958. *P. brachystachya* Pax. A stout shrub with leaves clustered at the ends of the branchlets.

Gold Coast : ? locality ! Aburi (Dec.) ! S. Nigeria : Abeokuta, amongst rocks ! ? locality ! Johann-Albrechtshöhe ; Victoria. Also in French Cameroons. Exsicc.—*Barter* 3385. *Millen* 149. *Farmar* 424.

52. TRAGIA Linn.—F.T.A. 6, 1 : 964.

Female flower on a long slender pedicel as long as the male raceme ; female calyx hardly accrescent in fruit ; leaves ovate-oblong, rounded or subcordate at the base, acute at the apex, 5–7·5 cm. long, 2–4 cm. broad, serrate, slightly bristly ; fruits deeply 3-lobed, 7 mm. broad, bristly-pilose .. .. 1. *volubilis*

Female flowers on very short pedicels (sometimes extending in fruit) ; female calyx usually accrescent in fruit :

Leaves deeply tripartite, sometimes the upper ones not tripartite ; lobes oblanceolate, coarsely serrate, 9–12 cm. long, more or less pubescent ; fruits setose 2. *cannabina* var. *intermedia*

Leaves not divided :

Leaves linear or linear-lanceolate, sessile or subsessile ; inflorescence long and slender ; 15 cm. or more :

Racemes unisexual ; leaves 4–5 cm. long, 1 cm. broad, nearly glabrous, slightly serrulate near the apex ; stems glabrescent .. .. .. 3. *akwapimensis*

Racemes bisexual ; leaves acute, 4–5 cm. long, 1 cm. broad, softly pubescent on both sides and with stinging hairs, sharply serrate ; stems pilose ; female calyx-segments 3, pectinately toothed .. .. 4. *Wildemanii*

Leaves broadly lanceolate to ovate-elliptic, distinctly petiolate ; inflorescence usually rather short :

Leaves lanceolate with the widest part nearest the base and gradually tapered upwards :

Male flowers several to each bract; plant erect or suberect; leaves narrowly deltoid-lanceolate, gradually acuminate, 9–10 cm. long, 3–4 cm. broad, widely cordate, bristly on the nerves, serrate; racemes up to 4 cm. long; female calyx-lobes 3 (or 4–5) in a single series, pectinately lobed and densely setose
5. *senegalensis*

Male flowers solitary to each bract; plants twining:
Female calyx-lobes 6, spathulate and either entire or alternately entire and laterally 2-toothed; leaves oblong-lanceolate, 4–5 cm. long, 1·5–2 cm. broad, somewhat bristly on both surfaces, shortly petiolate .. .. 6. *laminularis*
Female calyx-lobes 6, with a terminal foliaceous apex, pectinate in the lower part; leaves lanceolate, acute, 6–10 cm. long, 2–4·5 cm. broad, bristly on both surfaces, distinctly petiolate .. .. 7. *Chevalieri*
Female calyx-lobes 3, equally pectinate all round; leaves lanceolate, cordate at the base, 9–10 cm. long, 2–4 cm. broad, serrate, nearly glabrous except for the bristles, with fairly long petioles .. .. 8. *angustifolia*

Leaves more or less ovate, often widest about the middle, with rounded sides:
Female calyx-lobes entire:
Leaves glabrous or nearly so, ovate-elliptic, deeply cordate, obtusely acuminate, entire, 6–10 cm. long, 2–3·5 cm. broad; female calyx-lobes obovate, sparingly hirsute .. .. 9. *polygonoides*
Leaves pubescent all over, ovate-elliptic, rather shallowly cordate, acutely acuminate, 5–7·5 cm. long, 2·5–4 cm. broad; female calyx-lobes orbicular-subspathulate, very hairy .. .. 10. *spathulata*
Female calyx-lobes pectinate:
Leaves glabrous, entire or nearly so; female calyx-lobes pinnatipartite, only slightly accrescent, nearly glabrous; leaf-blades ovate-elliptic, auriculate-cordate, acutely acuminate, 8–18 cm. long, 5–8 cm. broad; inflorescence leaf-opposed, about 5 cm. long; male pedicels slender .. .. 11. *Preussii*
Leaves more or less pubescent, toothed:
Female calyx-lobes without a foliaceous apex, deeply pectinate and long-ciliate; leaves ovate, cordate, acutely acuminate, 5–10 cm. long, 2·5–5 cm. broad, sharply serrate; pedicels short .. .. 12. *Benthamii*
Female calyx-lobes with a foliaceous undivided apex, deeply pectinate, densely ciliate; leaves ovate-oblong, widely cordate, acutely acuminate, slightly toothed, 6–13 cm. long, 2·5–6 cm. broad, bristly pubescent mainly on the nerves; pedicels very short .. .. 13. *tenuifolia*

1. **Tragia volubilis** *Linn.*—F.T.A. 6, 1: 969; Chev. Bot. 583. A slender twiner armed with stinging hairs.
Sierra Leone: near Kurusu (Apr.)! Ivory Coast: Soubré; between Zagoué and Soucourala. Gold Coast: ? locality. S. Nigeria: Awka! Fernando Po (Dec.)! Extends to Congo and Angola; possibly introduced from tropical America. Exsicc.—*Mann* 75. *Sc. Elliot* 5514.
2. **T. cannabina** *Linn. f.* var., **intermedia** Prain—F.T.A. 6, 1: 976. Erect or suberect, glabrous, or pubescent in the upper parts and beset with stinging hairs.
N. Cameroons: Adamawa, Garua! Also in Shari-Chad, Nile Land and East Africa. Exsicc.—*Ledermann* 3304.
3. **T. akwapimensis** *Prain*—F.T.A. 6, 1: 992. Stems suberect from a woody base, 1½–2 ft. high, branched, sparingly armed with stinging hairs; dioecious.
Gold Coast: Aburi! Exsicc.—*Anderson* 54.
4. **T. Wildemanii** *Beille*—F.T.A. 6, 1: 993; Chev. Bot. 583. Erect from a woody base, 1–1½ ft. high, sparingly branched, softly pubescent and armed with stinging hairs.
French Sudan: Katou, on the Upper Niger! French Guinea: between Timbo and Farana. Exsicc.—*Chev.* 539.
5. **T. senegalensis** *Muell. Arg.*—F.T.A. 6, 1: 999; Chev. Bot. 583. Erect or scrambling, occasionally twining at the tips, pubescent and armed with stinging hairs; capsule 3-lobed, lobes bluntly angled on the back.
Gambia: Albreda, in rice-fields! French Guinea: Timbo. Gold Coast: Salaga! Togo: Kete Kratschi; Kekejandé. Dahomey: Atacora Mts., from Pobégou to Birni, 1,500 ft. N. Nigeria: Yola (Apr.)! Lokoja! Zungeru (May, June)! Also in French Cameroons. Exsicc.—*Leprieur* 736. *Dalz.* 157. *Parsons* 45. *Krause.*
6. **T. laminularis** *Muell. Arg.*—F.T.A. 6, 1: 971. Stem slender, woody and erect below, twining above, armed with stinging hairs.
Sierra Leone: ? locality! Exsicc.—*Smeathmann. Afzelius.*
7. **T. Chevalieri** *Beille*—F.T.A. 6, 1: 972; Chev. Bot. 583. A slender twiner armed with stinging hairs.
Ivory Coast: Middle Sassandra, Guidéko (June)! S. Nigeria: Ajilite! Oban! Exsicc.—*Millen* 172. *Talb.* 1494.
8. **T. angustifolia** *Benth.*—F.T.A. 6, 1: 999; Chev. Bot. 583. A slender branched twiner several feet long, pubescent and sparsely armed with stinging hairs; capsule 3-lobed, the lobes bluntly angled on the back.
Dahomey: Zagnanado, between Massé and Ketou. N. Nigeria: Nupe! S. Nigeria: Lower Niger! Lagos! Also in N. Cameroons. Exsicc.—*T. Vogel* 108. *Barter* 1732. *Dawodu* 205.
9. **T. polygonoides** *Prain*—F.T.A. 6, 1: 970; Chev. Bot. 583. A slender twiner without stinging hairs.
Ivory Coast: Bouroukrou (Dec., Jan.)! Exsicc.—*Chev.* 16860.
10. **T. spathulata** *Benth.*—F.T.A. 6, 1: 971. A slender pubescent twiner armed with stinging hairs; capsule densely bristly.
Gold Coast: Cape Coast (July)! Odumase, Krobo Plains (Aug.)! N. Terr.; Rousu, Gida Abdulker! Togo: Misahöhe! N. Nigeria: Naraguta, Nelli's Valley (June)! S. Nigeria: Abeokuta! Olokemeji (Apr.)! Exsicc.—*T. Vogel* 8. *Johnson* 1089. *Farmar* 411; 438. *Irving* 72.
11. **T. Preussii** *Pax*—F.T.A. 6, 1: 989. Stem twining, nearly glabrous, without stinging hairs.
S. Nigeria: Oban! Victoria! Barombi! Exsicc.—*Talb.* 624. *Preuss* 467.
12. **T. Benthamii** *Baker*—F.T.A. 6, 1: 984. *T. kassiliensis* Beille—Chev. Bot. 583. Stems twining, nearly glabrous and sparingly armed with stinging hairs.
Ivory Coast: Agniéby Valley, Kassilé, in forest (Jan.)! Baoulé Nord, between Gottoro and Diahbo (July)! Gold Coast: Cape Coast (July)! Ashanti! Togo: Misahöhe. Dahomey: Adja Ouéré. S. Nigeria: Lagos! 70 miles east of Lagos! Abeokuta! Oban! Cameroons Mt., 1,000 ft. (Dec.)!

Fernando Po : near Clarence (Oct.) ! Extends to Uganda, Congo, Angola and East Africa. Exsicc.—*T. Vogel* 26 ; 53. *Mann* 1255. *Cummins*. *Millen* 80.

13. **T. tenuifolia** *Benth.*—F.T.A. 6, 1 : 973. Stem twining, nearly glabrous and armed with stinging hairs.
Sierra Leone : Bagroo River (Apr.) ! Kambia (Jan.) ! Magbile (Dec.) ! Togo : Bismarckburg ! Misahöhe. S. Nigeria : Lower Niger ! Onitsha ! Johann-Albrechtshöhe. Also in French Cameroons, St. Thomas Island, Gabon, and Belgian Congo. Exsicc.—*Barter* 511. *Mann* 834. *Sc. Elliot* 4371. *Thomas* 1855 ; 6403. *Kling* 140.

53. DALECHAMPIA Linn.—F.T.A. 6, 1 : 952.

Involucral bracts ovate, entire ; leaves ovate and not lobed or deeply 3-lobed ; stipules subulate-lanceolate ; female sepals accrescent, pinnatifid .. 1. *ipomoeaefolia*
Involucral bracts 3-lobed and serrulate ; stipules ovate-lanceolate ; female sepals as above .. .. 2. *scandens*

1. **D. ipomoeaefolia** *Benth.*—F.T.A. 6, 1 : 953 ; Chev. Bot. 584. A slender twiner with pubescent stems and flowers in close clusters within two leafy bracts.
Liberia : Monrovia and Grand Bassa. Ivory Coast : Bouroukrou ; Zaranou. Gold Coast : Ashanti, near Sutah ! S. Nigeria : Lagos, Ikoyi (Dec.) ! Lower Niger ! Degema ! Oban ! Eket ! Also in French Cameroons, Spanish Guinea, Gabon and Congo Basin. Exsicc.—*T. Vogel* 9. *Cummins* 48. *Dalz.* 1270. *Thomas* 318. *Talb.* 3365 ; 3802.
2. **D. scandens** *Linn.*—F.T.A. 6, 1 : 954. Like the last but with leaves always deeply 3–5-partite.
Senegal : Dakar ; Dagana ; Richard Tol. Also in Cape Verde Islands, Chad area and extending to Angola, Nile Land, East Africa and Arabia. Exsicc.—*Adamson*. *Leprieur*. *Perrottet* 740 (not seen).

54. PLAGIOSTYLES Pierre—F.T.A. 6, 1 : (170) 1001.

Branchlets glabrous ; leaves oblong-elliptic, abruptly acuminate, slightly cuneate or rounded at the base, 15–20 cm. long, 5–7 cm. broad, obscurely toothed, thinly coriaceous, markedly reticulate ; lateral nerves 5 pairs ; petiole 1–1·5 cm. long, pulvinate at the base and apex ; flowers dioecious ; male racemes about 5 cm. long ; pedicels up to 8 mm. long ; stamens 15–21, anthers papillous ; fruit transversely oblong, 2 cm. across, with a lateral stigma .. .. *africana*

P. africana *Prain*—F.T.A. 6, 1 : 1001 (as *P. Klaineana* Pierre). A tree, 30–40 ft. high, with milky sap.
S. Nigeria : Oban ! Barombi ; Johann-Albrechtshöhe. Also in French Cameroons and extending to Congo Basin. Exsicc.—*Talb.* (no number). *Preuss* 421. *Staudt* 496.

55. SEBASTIANIA Spreng.—F.T.A. 6, 1 : 1007.

Shrub ; leaves oblong-lanceolate, caudate-acuminate, rounded at the base, 6–13 cm. long, 3–5 cm. broad, minutely denticulate with glandular teeth ; male spikes branched, axillary, about ¼ as long as the leaves, female inflorescences mixed with the male ; stamens 2–4 ; ovary smooth .. .. 1. *inopinata*
Herb ; leaves linear, not acuminate, narrowed at the base, 3–6 cm. long, up to 0·8 cm. broad, closely serrulate and cartilaginous on the margin ; spikes simple, terminal or leaf-opposed, short ; stamens 3 ; ovary and fruit muricate with 2 rows of bristles on each cell .. .. 2. *Chamaelea*

1. **S. inopinata** *Prain*—F.T.A. 6, 1 : 1007. A glabrous shrub 8–12 ft. high.
S. Nigeria : Cameroons River (Jan.) ! Also in French Cameroons. Exsicc.—*Mann* 755 ; 2225.
2. **S. Chamaelea** *Muell. Arg.*—F.T.A. 6 , 1 : 1008 ; Chev. Bot. 584. A more or less woody herb, glabrous, branched, 1–2 ft. high.
Togo : Lome ! Agome ! Dahomey : Cotonou ; near Ouidah ; Agouagon. N. Nigeria : Lokoja ! Nupe ! Zungeru (July) ! Abinsi (Nov.) ! Yola (Sept.) ! S. Nigeria : Idah (Sept.) ! Lagos ! Awka, Agolo, Obu district ! Also in Shari-Chad area ; widely spread throughout S.E. Asia to N. Australia. Exsicc. —*T. Vogel* 51. *Ansell*. *Barter* 1492. *Dawodu* 287. *Dalz.* 72 ; 160 ; 748.

56. SAPIUM P. Br.—F.T.A. 6, 1 : 1009.

Tree ; leaves elliptic or oblong-elliptic, acute, with 1 or 2 pairs of glands near the base, up to 15 cm. long and 5 cm. broad, serrulate ; flowers monoecious ; spikes terminal, 5–11 cm. long, with a few pedicellate female flowers at the base ; stamens 2–3 ; fruit usually 2-celled, 2-lobed, about 1 cm. broad .. .. 1. *ellipticum*
Shrubs or undershrubs, often with woody rhizomes :
Leaves elliptic to obovate-elliptic :
Leaves caudate-acuminate, distinctly petiolate, more or less narrowed at the base, 5–22 cm. long, 4·5–7 cm. broad, biglandular at the base ; female flowers few and subsessile at the base of the slender male spikes ; fruits about 1 cm. broad 2. *guineense*
Leaves not or only slightly acuminate, sessile or subsessile, rounded at the base :
Leaves with about 12 pairs of lateral nerves, 4–13 cm. long, 3–5 cm. broad, biglandular at the base ; spikes slender, with 1–2 shortly stalked female flowers at the base ; fruits 2 cm. broad .. .. 3. *Grahamii*
Leaves with 3–5 pairs of obscure lateral nerves, 2·5-3 cm. long, 1·5–2 cm. broad, not glandular at the base, minutely denticulate ; spikes 4–6 cm. long, with 1–2 female flowers at the base .. .. 4. *faradianense*
Leaves linear or oblong-linear, acute, 2–4 cm. long, up to 8 mm. broad, nerves scarcely visible, the margin cartilaginous and undulate with a pair of glands on each side at

the base ; spikes slender with 1–2 subsessile female flowers at the base ; fruit about 8 mm. diam. .. .. 5. *Dalzielii*

1. **Sapium ellipticum** *Pax*—F.T.A. 6, 1 : 1016 as *S. mannianum* Benth. ; Chev. Bot. 584. A tree sometimes reaching 100 ft., glabrous, or slightly pubescent on the inflorescence and young twigs.
From French Guinea to Nigeria and throughout tropical Africa ; also in S. Africa. Exsicc.—*Sc. Elliot* 5342 ; 5508. *Dalz.* 423. *Shaw* 104. *Kersting* 391. (See Appendix).
2. **S. guineense** *O. Kuntze*—F.T.A. 6, 1 : 1011 ; Chev. Bot. 585 as *Excoecaria guineensis* Muell. Arg. ; *E. comoensis* Beille in Chev. Bot. 584, name only. A glabrous shrub or undershrub, 2–5 or more feet high.
Sierra Leone : Freetown, common (Dec.) ! Liberia : Monrovia. Ivory Coast : several localities ! S. Nigeria : Oban ! Johann-Albrechtshöhe. Also in French Cameroons, Princes Island and Lower Congo. Exsicc.—*Afzelius. Morson. Don. Sc. Elliot* 5906. *Dalz.* 975 (partly). *Talb.* 666. *Chev.* 17577.
3. **S. Grahamii** *Prain*—F.T.A. 6, 1 : 1012 ; Chev. Bot. 584 (and as *Excoecaria Grahamii* Stapf p. 585). A glabrous shrub or undershrub sending up half-woody stems from a creeping rootstock, with milky juice ; capsule pale, crustaceous, breaking up into three 2-valved cocci.
French Sudan : Mossi, near Ouagadougou ; Penia. French Guinea : Kollangui. Sierra Leone : Sulima (fr. Jan.) ! Ivory Coast : Penue. Gold Coast : Gambaga (Apr.) ! Tamale (Apr.) ! Kintampo (Mar.) ! Togo : Yendi (Apr.) ! Gabotawe ; Basari. Dahomey : Djougou, in savannah after burning. Exsicc.—*Graham. Evans* 8. *Dalz.* 37. *Kersting* 276 ; 605. (See Appendix).
4. **S. faradianense** *Pax*—F.T.A. 6, 1 : 1012 ; Chev. Bot. 585 as *Excoecaria faradianensis* Beille. A small glabrous undershrub ; stems slender, woody, from the crown of an erect rootstock.
French Guinea : Faradiana ! between Karokaro and Niana. Exsicc.—*Chev.* 610 ; 2611.
5. **S. Dalzielii** *Hutch.* in Kew Bull. 1917 : 234. Stems erect, slender, slightly branched, 1–2 ft. high, leafy from base to apex, glabrous, from a woody rootstock.
N. Nigeria : Katsina Allah (June) ! Exsicc.—*Dalz.* 749.

57. MAPROUNEA Aubl.—F.T.A. 6, 1 : 1002.

A tree, all parts glabrous ; leaves ovate or ovate-elliptic, rounded and slightly unequal-sided at the base, obtuse at apex, 4–8 cm. long, 2–3·5 cm. broad, entire, glaucous below ; lateral nerves about 6–8 pairs, spreading, much branched ; male inflorescences ovoid, 0·5 cm. long, shortly pedunculate, usually with 2 or more pedicellate female flowers below ; stamens 2 ; capsule globose, 3-lobed, about 0·5 cm. broad *membranacea*

M. membranacea *Pax & K. Hoffm.*—F.T.A. 6, 1 : 1002. Up to 50 ft. high ; inflorescence and fruit red.
S. Nigeria : Udi Plateau, 1,750 ft., fairly common (Mar.) ! Eket ! Also in French Cameroons, Spanish Guinea, Gabon, and Congo Basin. Exsicc.—*Ainslie. Talb.* 3253.

58. ANTHOSTEMA A. Juss.—F.T.A. 6, 1 : 607.

Leaves cuneate at the base, elliptic with rounded margins, obtusely acuminate, 7·5–13 cm. long, 3–4·5 cm. broad, with numerous lateral nerves spreading at right angles ; flowers cymose ; cymes subsessile, axillary, rather densely flowered ; fruits deeply 3-lobed, nearly 2·5 cm. broad .. .. 1. *senegalense*

Leaves rounded or very broadly cuneate at the base, oblong with more or less straight margins, 8–15 cm. long, 2·5–4·5 cm. broad ; cymes rather densely flowered ; fruits up to 3 cm. broad .. .. 2. *Aubryanum*

1. **A. senegalense** *A. Juss.*—F.T.A. 6, 1 : 607 ; Stapf 648 ; Chev. Bot. 553. A tree with glabrous branchlets and rather leathery leaves ; juice milky.
French Sudan : Moussaia ; Nono. Senegal : ? locality ! Sedhiou ; Ziguinchor. Gambia : Abuko (Jan.) ! French Guinea : Konakry (Jan.) ! Tristao Island ! Timbo ; Kouria. Sierra Leone : Daragbe, Samu country (fr. Dec.) ! Bawbaw, on sea-shore (fr. Dec.) ! Kessewe (fr. Feb.) ! Liberia : Monrovia ! Grand Bassa ! Ivory Coast : Dabou, Abidjean, Bingerville. Exsicc.—*Heudelot* 592. *Leprieur. Sc. Elliot* 4301. *Lane-Poole* 432. *Dalz.* 8057. *Paroisse* 1. *Dinklage* 1769. (See Appendix).
2. **A. Aubryanum** *Baill.*—F.T.A. 6, 1 : 608. A tree 30–40 ft. high with glabrous branchlets ; leaves shining above ; juice milky.
Gold Coast : W. Apollonia (Aug.) ! S. Nigeria : in swamp near Ajilite ! Also in Princes Island and Gabon. Exsicc.—*Millen* 178. *Chipp.* 324.

59. DICHOSTEMMA Pierre—F.T.A. 6, 1 : 605.

A small tree or climber ; branchlets glabrous ; leaves obliquely oblong-lanceolate, acuminate, shortly cuneate at the base, 7–16 cm. long, 2·5–6 cm. broad, entire, glabrous, glaucous below ; lateral nerves 6–8 pairs, looped ; panicles terminal, up to 40 cm. long, puberulous ; involucres cup-like, obtusely 4-angled, up to 5 mm. broad ; male flowers reduced to a single stamen ; fruits depressed-quadrangular, 4-lobed, 3 cm. broad, rusty-tomentellous .. .. *glaucescens*

D. glaucescens *Pierre*—F.T.A. 6, 1 : 606. Slender tree, 18–25 ft. high, or said to be climbing ; juice milky.
S. Nigeria : Oban ! Also in French Cameroons, Gabon and Belgian Congo. Exsicc.—*Talb.* 2328. (See Appendix).

60. EUPHORBIA Linn.—F.T.A. 6, 1 : 470.

Annuals or perennials with annual stems, small or very small leaves, and very small inflorescences (" flowers ") ; neither fleshy nor prickly :/

Stems and often the leaves rather densely pubescent or tomentose ; inflorescences crowded into close cymes :

Leaves oblong-elliptic, very unequal and subcordate at the base, rounded at the top, up to 2 cm. long and 1 cm. broad, conspicuously denticulate, branchlets densely softly tomentose with spreading hairs ; fruit 2 mm. broad .. .. 1. *scordifolia*

Leaves obliquely ovate to lanceolate, rounded on one side, cuneate on the other at the

base, acute or subobtuse at the apex, up to 5 cm. long and 2 cm. broad, finely serrate, thinly pilose below ; branchlets rather coarsely pilose with yellowish hairs over a shorter indumentum ; cymes more or less pedunculate ; fruit 1·5 mm. broad 2. *hirta*

Leaves lanceolate, very unequal at the base, obtuse at the apex, up to 4 cm. long and 1·3 cm. broad, minutely serrulate or subentire, shortly pubescent ; branchlets more or less densely pubescent ; cymes subsessile, woolly-tomentose ; fruits woolly, 2–2·5 mm. broad .. .. 3. *convolvuloides*

Stems and leaves glabrous or at most puberulous or slightly pubescent ; inflorescences mostly solitary or very few together :

Ovary and fruit pubescent :

Leaves broadly lanceolate, more or less narrowed to the apex, about 6–7 mm. long, thinly pubescent ; involucral glands with petaloid appendages .. 4. *Afzelii*

Leaves broadly oblong-elliptic, rounded at the apex :

Fruits hairy only on the angles ; branchlets with the hairs on one side ; leaves very small, up to about 7 mm. long .. .. 5. *prostrata*

Fruits hairy all over ; branchlets with the hairs all round ; leaves up to 1·5 cm. long .. .. 6. *aegyptiaca*

Ovary and fruit glabrous :

Leaves suborbicular, subcordate at the base, emarginate at the apex, 3–5 mm. long and broad ; branches prostrate ; involucral glands minute, with a white petal-like appendage ; fruit nearly 2 mm. broad .. .. 7. *serpens*

Leaves oblong-elliptic to lanceolate :

Leaves broadly rounded to the apex, obliquely elliptic, unequally cordate at the base, up to 2 cm. long and 1 cm. broad, serrulate, glaucous ; involucral glands minute, with a narrow petaloid appendage .. .. .. 8. *glaucophylla*

Leaves narrowed to the apex, more or less lanceolate :

Perennial with woody rootstock ; branches puberulous ; leaves entire except at the very tip, 1–2 cm. long, up to 0·8 cm. broad .. .. .. 9. *Kerstingii*

Annuals ; branchlets glabrous :

Leaves distinctly 3-nerved at the base, more or less toothed all round the margin, very unequal at the base ; involucres in cymes .. 10. *hypericifolia*

Leaves not or very obscurely nerved at the base, toothed only towards the tip ; involucres solitary .. ..11. *polycnemoides*

Herbs with fairly large leaves or woody shrubs, rarely fleshy but not prickly :

Leafy plants :

Involucres more or less cymose and subtended by large leafy bracts :

Leaves lanceolate, numerous, glaucous below, 4–10 cm. long, 1–2·5 cm. broad ; leafy bracts ovate, opposite, slightly unequal, up to 4 cm. long .. 12. *ampla*

Leaves obovate, few :

Bracts subtending the involucres about 1 cm. long, broadly obovate ; leaves slightly acuminate, 10–15 cm. long, 4–6 cm. broad, with several pairs of distinct lateral nerves ; glands of the involucre with fringed lobes .. 13. *Cervicornu*

Bracts subtending the involucres about 3 cm. long, rounded-ovate ; leaves subcoriaceous, apiculate, 7–15 cm. long, 3–5·5 cm. broad, with rather obscure lateral nerves ; glands of the involucre with denticulate lobes ; fruit 1·5 cm. broad 14. *macrophylla*

Involucres solitary, terminal, not bracteate :

Leaves linear or linear-lanceolate :

Low herb with simple stems ; leaves few, linear-lanceolate, mucronate, 5–14 cm. long, 1–2 cm. broad, slightly fleshy, lateral nerves inconspicuous ; involucres very shortly stalked, terminal ; capsule about 1·5 cm. broad, reticulate 15. *calva*

Shrub ; leaves crowded at the tops of the branchlets, linear, mucronate, 2·5–5 cm. long ; involucres subsessile, lobes fringed with hairs .. .. 16. *balsamifera*

Leaves obovate, cuneate at the base, mucronate at the apex, 4–8 cm. long, 2·5–3·5 cm. broad, nerveless below, glabrous ; peduncle terminal, 2 cm. long ; involucre about 7 mm. diam. .. .. 17. *kouandenensis*

Leafless or nearly leafless plants ; stems woody or fleshy :

Stems woody below, dichotomously branched ; leaves only at the tips of the shoots, linear, 2–4 cm. long, up to 8 mm. broad, 1-nerved ; involucre terminal, solitary, subsessile .. .. 18. *Rogeri*

Stems fleshy, irregularly branched ; leaves scattered, linear-lanceolate, up to 4 cm. long, 1-nerved ; involucres umbellate, pedunculate ; female flower long-stipitate 19. *lateriflora*

Cactiform shrubs with fleshy stems and leaves or leafless, usually armed with prickles :

Plants without prickles ; branches very stout, areolate ; leaves obovate-spathulate, widely notched at the apex, long-cuneate, 8–14 cm. long, 4–7 cm. broad, subflabellately nerved ; involucres nearly sessile, axillary, lobes fringed 20. *Poissonii*

Plants armed with prickles :

Prickles solitary, subulate from a very broad base, about 1 cm. long, glaucous-grey : leaves few, oblong-spathulate, sometimes 2-lobed at the apex, mucronate, subentire or fringed ; involucres cymose, lobes fringed .. .. 21. *unispina*

Prickles paired :

Leaves large, obovate-oblanceolate, rounded at the apex, obtusely mucronate, 8–10 cm. long, 2–3·5 cm. broad, entire ; stems very thick and fleshy, deeply 4-lobed in section ; prickles spreading, about 3 mm. long .. .. 22. *leonensis*

Leaves absent or minute ; cymes subsessile or shortly pedunculate, numerous, on the margins of the flattened stems ; bracts subtending the involucres dentate, broad ; lobes of involucre deeply fringed, female flower with a distinct fringed calyx 23. *kamerunica*

1 **Euphorbia scordifolia** *Jacq.*—F.T.A. 6, 1 : 501 ; Holl. 4 : 575 ; Chev. Bot. 552. " *E. thymifolia* Burm.," Chev. Bot. 552. An erect or prostrate annual, densely tomentose on all parts.
French Sudan : Timbuktu, on dunes. Senegal : various localities, common ! Sierra Leone : Talla Hills, Ninia ! Ivory Coast : Lower Comoé ! N. Nigeria : Lokoja (Aug.) ! Kuka (Jan.) ! Bure, near Lake Chad (Dec.) ! Also in Mauritania and Cape Verde Islands ; extending to the Red Sea and Nile Land. Exsicc. – *Sieber* 17. *Roger* 29. *Heudelot* 474. *Perrottet* 177. *Lelievre* 53. *E. Vogel* 6. *Sc. Elliot* 4993. *Elliott* 109. *Chev.* 17584.

2. **E. hirta** *Linn.*—F.T.A. 6, 1 : 496 ; Holl. 4 : 573 ; Stapf 646 ; Chev. Bot. 552 (as *E. pilulifera* L.). An annual 4–16 in. high, erect or decumbent, sometimes purple-tinged ; a common weed in tropical and subtropical countries. (See Appendix).

3. **E. convolvuloides** *Hochst.*—F.T.A. 6, 1 : 495 ; Holl. 4 : 573 ; Chev. Bot. 551. A usually erect branched annual, 6–20 in. high, like the preceding ; a weed of sandy and waste places.
French Sudan : Bobo-Dioulasso. Senegal : Upper Senegal R. Ivory Coast : Sassandra and Bafing R. confluence. Gold Coast : Salaga ! Togo : ? locality. Dahomey : Atacora Mts., from Kouandé to Kouba 1,700 ft. N. Nigeria : Lokoja ! Nupe ! Sokoto ! Katagum ! Rinjim Mukr, 2,500 ft. Benue R. ! S. Nigeria : Lagos ! Idah ! Also in French Cameroons, and extending to E. Sudan and E. Africa. Exsicc.—*T. Vogel* 85. *Ansell. Barter* 1489. *Krause.* (See Appendix).

4. **E. Afzelii** *N. E. Br.*—F.T.A. 6, 1 : 506. Stems prostrate, half woody below, pubescent, or glabrous on the under-side.
Sierra Leone ! Exsicc.—*Afzelius.*

5. **E. prostrata** *Ait.*—F.T.A. 6, 1 : 510, 1036 ; Holl. 4 : 574 ; Chev. Bot. 552. A prostrate spreading annual, 2–8 in. long ; a weed of footpaths, etc.
Senegal : ? locality ! French Guinea : Konakry. Sierra Leone : Freetown ! Liberia : Cape Palmas. Ivory Coast : Malamalasso. Gold Coast : Aburi ! Adafo. S. Nigeria : Lagos ! Calabar ! Fernando Po ! Also in Cape Verde Islands, French Cameroons, Princes and St. Thomas Islands, Gabon, Congo, Uganda, East and South Africa ; a native of tropical America. Exsicc.—*Don. T. Vogel* (no number). *Barter* (no number). *Mann* 213. *Johnson* 238. *Farmar* 8. *Millen* 23. (See Appendix).

6. **E. aegyptiaca** *Boiss.*—F.T.A. 6, 1 : 507 ; Holl. 4 : 572 ; Chev. Bot. 550. *E. granulata* A. Chev. Bot. 551, not of Hochst. A prostrate spreading annual, a few inches to 1 ft. long ; a weed of pastures, etc.
French Sudan : Timbuktu ! Senegal : several localities ! Sierra Leone : ? locality ! N. Nigeria : Nupe ! Lokoja ! Abinsi ! Yola ! Katagum ! Kuka ! S. Nigeria : Rio del Rey ! Also in Cape Verde Islands, Congo and S.W. Africa ; extends to Egypt, Arabia and Syria. Exsicc.—*Guillemin. Heudelot. Perrottet. E. Vogel* 2. *Barter* 316 ; 834. *Johnston. Chev.* 1283. (See Appendix).

7. **E. serpens** *H. B. & K.*—F.T.A. 6, 1 : 511. A prostrate spreading annual, 3–7 in. long, glabrous.
Sierra Leone : Freetown (June) ! A native of tropical America. Exsicc.—*T. Vogel* 29.

8. **E. glaucophylla** *Poir.*—F.T.A. 6, 1 : 499. Stems slender, prostrate, a few inches to over 1 ft. long, glabrous, woody at the base.
Senegal : by the sea-shore ! Gambia ! Liberia : Grand Bassa (July) ! Gold Coast! Half Assinie, by the sea (July) ! S. Nigeria : Lagos, Victoria Beach (Mar.) ! Nun R. (Aug.) ! Also French Cameroons to Angola, on the coast. Exsicc.—*Sieber* 18. *T. Vogel* 10 ; 54.

9. **E. Kerstingii** *Pax*—F.T.A. 6, 1 : 500. Prostrate, branching, woody below.
Togo : Trogode, Koenigsdorf, in savannah ! Kete Kratschi. Exsicc.—*Kersting* 35.

10. **E. hypericifolia** *Linn.*—F.T.A. 6, 1 : 498 ; Stapf 646 (as *E. indica* L.) ; Chev. Bot. 551. Stems erect, 3–18 in. high, or prostrate, branching.
Senegal : St. Louis ! Upper Senegal R. Sierra Leone : Musaia ! Liberia : Cape Palmas (July) ! Grand Bassa. Ivory Coast : Upper Sassandra, Toura country ! Gold Coast : Accra (May) ! Togo. Dahomey. S. Nigeria : Ogurude (Jan.) ! Throughout tropical Africa and in other warm regions. Exsicc. —*Ansell. Holland* 267. *Dalz.* 140. *Chev.* 3495 ; 21608.

11. **E. polycnemoides** *Hochst.*—F.T.A. 6, 1 : 506 ; Chev. Bot. 552. Stems prostrate, 4–14 in. long, sometimes erect from a woody base ; leaves often purple-tinged ; a field weed.
French Sudan : Koulikoro ; Gourma. Gold Coast : Kintampo (Mar.) ! N. Nigeria : Sokoto (Mar., Aug., Sept.) ! Takwara, 3,200 ft. (May) ! Liruwen-Kano Hills ! Also in N. Cameroons ; extending to the Red Sea and East Africa. Exsicc.—*Dalz.* 33 ; 395. *Moiser* 99. *Lely* 115. *Carpenter.* (See Appendix).

12. **E. ampla** *Hook. f.*—F.T.A. 6, 1 : 532. Stems 2–4 ft. high, probably from a perennial rootstock ; leaves alternate with a whorl of 4–10 below the umbel ; fruit smooth, ⅛ in. diam.
Cameroons Mt. : 7,000–8,400 ft. (Nov., Dec.) ! Between Buea and Mann's Fountain ! Buea. Fernando Po : 8,500 ft. (Dec.) ! Also on Bansso and Manenguba Mts. Exsicc. – *Mann* 614 ; 1265 ; 2006. *Preuss* 636.

13. **E. Cervicornu** *Baill.* –F.T.A. 6, 1 : 528. Erect perennial, 2–3 ft. high with rather soft half-woody branches, glabrous.
S. Nigeria : Calabar River (Feb.) ! Also in St. Thomas Island and Congo. Exsicc.—*Mann* 2315.

14. **E. macrophylla** *Pax*—F.T.A. 6, 1 : 529. Like the last ; 1½ ft. or more high ; leaves alternate, distant, with a whorl of 3–5 below the flower umbel.
Gold Coast : Gambaga (Aug.) ! Also in E. Sudan and Tanganyika. Exsicc.—*Norman.*

15. **E. calva** *N. E. Br.* –F.T.A. 6, 1 : 522. Perennial with a thickened rootstock and stems up to about a foot high, glabrous.
N. Nigeria : Katsina Allah (June) ! Kyana, Nassarawa Province (Feb., Mar.) ! Also in French Cameroons. Exsicc.—*Dalz.* 754. *Hepburn.*

16. **E. balsamifera** *Ait.* Hort. Kew. ed. 1, 2 : 137 ; Chev. Bot. 550. *E. sepium* N. E. Br.—F.T.A. 6, 1 : 551 ; 1040 ; Holl. 4 : 575. A common hedge-shrub in the dry regions, with glabrous half-succulent forking branches.
Senegal : Sor Island, Cayor and Dakar. French Sudan : Danga ! Togo. N. Nigeria : Sokoto ! Katagum ! Exsicc.—*Dalz.* 320 ; 528. (See Appendix).

17. **E. kouandenensis** *Beille* in Chev. Bot. 552, name only. Rootstock fleshy, thick ; stems up to 8 in. high.
Dahomey : Kouandé (June) ! Atacora Mts. ! Exsicc.—*Chev.* 24014 ; 24069 ; 24248.

18. **E. Rogeri** *N. E. Br.*—F.T.A. 6, 1 : 551. A much-branched shrub, succulent in the younger parts ; fruits ½ in. diam., pubescent.
Senegal : in sand on the heights of Lampsar and Maka (Dec.–Jan.) ! S. Nigeria : Lagos ! Also in Rio de Oro, Cape Jubi. Exsicc.—*Roger*. *Farmar* 54.

19. **E. lateriflora** *Schum. & Thonn.*—F.T.A. 6, 1 : 552 ; Holl. 4 : 573. A common hedge-shrub with lax hanging branches, smooth-glaucous, leafy when young.
Gold Coast : Chama (Apr.) ! Togo : Kratschi. N. Nigeria : Sokoto ! Katagum ! Jos (Mar.) ! S. Nigeria : Epe ! Exsicc.—*Barter* 3309. *Chipp* 188. *Dalz.* 327 ; 392. *Hill* 21. (See Appendix).

20. **E. Poissonii** *Pax*—F.T.A. 6, 1 : 560 ; Holl. 4 : 574 ; Chev. Bot. 552. A shrub up to 5 ft. high with cylindric fleshy branches bearing a few deciduous leaves at the apex ; fruits ¼ in. diam., glabrous, long-exserted.
Gold Coast : ? locality ! Togo : various localities. Dahomey : Savalou, Bassila village. N. Nigeria : Nupe ! Exsicc.—*Barter* 1491. *Anderson*. (See Appendix).

21. **E. unispina** *N. E. Br.*—F.T.A. 6, 1 : 561 ; Holl. 4 : 578. Like the preceding but spiny, up to 10 ft. high.
Togo : Loso ! Difale, between Sokode and Basari ! N. Nigeria : Katagum, etc. ! Exsicc.—*Dalz.* 329. *Kersting* 569 ; 573. (See Appendix).

22. **E. leonensis** *N. E. Br.*—F.T.A. 6, 1 : 563. A shrub with fleshy angled branches armed with stipular spines.
Sierra Leone : Regent ! Exsicc.—*Sc. Elliot* 4112.

23. **E. kamerunica** *Pax*—F.T.A. 6, 1 : 586. *E. Barteri* N. E. Br. ; Holl. 4 : 572. A candelabrum-like tree up to 20 ft. high, like the last ; angles wing-like, sinuate-toothed.
N. Nigeria : Nupe, Ketsa Rock ! S. Nigeria : Barombi ! Exsicc.—*Barter* 1012. *Preuss* 511. (See Appendix).

61. ELAEOPHORBIA Stapf—F.T.A. 6, 1 : 604.

A tree with woody stem ; young parts fleshy, clothed with pairs of broad-based prickles about 0·5 cm. long ; leaves oblanceolate to obovate, sometimes widely emarginate at the apex, 8–21 cm. long, 4–9 cm. broad, fleshy, entire ; peduncles forked with a sessile involucre in the fork, the branches about 2·5 cm. long ; involucre with 5 transversely oblong denticulate lobes and 5 fleshy similar-shaped glands ; male flowers numerous ; female solitary, subsessile ; fruit a fleshy drupe, cuneate at the base, about 3 cm. long *drupifera*

E. drupifera *Stapf*—F.T.A. 6, 1 : 604 ; Stapf 646 ; Chev. Bot. 551. A tree up to 40–50 ft. high, with stiff branches, angular when young, becoming cylindric.
French Guinea : Futa Jallon, Ditinn, Labé, Diaguissa, Timbo, Dalaba, 3,000–4,000 ft. Sierra Leone (cultivated specimen). Ivory Coast : Bouroukrou. Gold Coast : very common behind Accra (Dec., Feb.) ! Kpong ! Newtown (frontier, on the coast) ! Togo. Dahomey. Also in French Cameroons and Congo region. Exsicc.—*Johnson* 605 ; 1053. *Farmar* 480.

78. ROSACEAE.

Trees, shrubs or herbs. Leaves various, simple or compound, alternate or rarely opposite ; stipules mostly present and paired, sometimes adnate to the petiole. Flowers actinomorphic or subzygomorphic, usually hermaphrodite. Calyx free or adnate to the ovary ; lobes imbricate. Petals present, rarely absent, imbricate. Stamens usually numerous ; filaments free or connate ; anthers small, 2-celled. Carpels 1 or more, free or connate, superior or inferior ; styles free or rarely connate. Ovules 2 or more in each carpel, superposed. Fruit superior or inferior, drupaceous, pomaceous, follicular or achenial. Seeds without endosperm.

A cosmopolitan family rather poorly represented in the tropics ; distinguished from *Ranunculaceae* by the perigynous type of flower and absence of endosperm. The tribe *Chrysobalaneae* closely connects with the *Caesalpiniaceae*.

Herbs with prostrate, not prickly, stems ; carpels more than 1 :
  Leaves digitately lobed ; calyx without setiform bracts ; petals 0 ; stamens usually 4 ; carpels 5, free, not all fertile .. .. 1. **Alchemilla**
  Leaves pinnately lobulate ; calyx-tube surrounded with setiform bracteoles ; petals 5, small ; stamens about 10 ; carpels 5–10, more or less consolidated with the calyx-tube .. .. 2. **Neurada**
Scrambling shrubs with prickly stems and compound leaves ; ovary apocarpous, carpels numerous on a subglobose torus .. .. 3. **Rubus**
Trees or shrubs ; carpels usually solitary :
  Style or stigma terminal ; flowers in simple racemes .. .. .. 4. **Pygeum**
  Style basal or gynobasic :
    Filaments free or united only at the base :
      Ovary at the base of the calyx-tube (receptacle) :
        Petals present ; flowers hermaphrodite, in short cymes .. 5. **Chrysobalanus**
        Petals absent ; flowers polygamous, in panicles .. .. 6. **Afrolicania**
      Ovary or ovaries sessile at the mouth of the calyx-tube (receptacle) 7. **Parinarium**
    Filaments united into a unilateral strap-shaped bundle ; ovary at the mouth of the calyx-tube .. .. 8. **Acioa**

1. ALCHEMILLA Linn.—F.T.A. 2 : 377.

Low creeping herbs with slender prostrate branches, the latter densely pilose with spreading hairs; leaves suborbicular in outline, shortly digitately 5-7-lobed, deeply serrate, 1·5–2 cm. diam., long-pilose; petiole about as long as the leaf, pilose; stipules large and foliaceous, toothed at the apex; flowers in leafy axillary racemes with foliaceous deeply toothed bracts .. .. 1. *tenuicaulis*

Low creeping herb; branches spreadingly pilose; leaves reniform in outline, digitately 5-lobed nearly to the middle, deeply toothed, 3–3·5 cm. broad, thinly pilose; petiole longer than the leaf, pilose; stipules large and foliaceous, elliptic, toothed, about 8 mm. long; flowers as above .. .. 2. *cryptantha*

1. **A. tenuicaulis** *Hook. f.*—F.T.A. 2 : 378. *A. cryptantha* var. *tenuicaulis* Engl.
Cameroons Mt.: 7,000 ft. (Dec.)! Fernando Po, 7,500 ft.! Exsicc. *Mann* 1447; 1984.
2. **A. cryptantha** *Steud.*—F.T.A. 2 : 377.
Cameroons Mt.: 7,800 ft. (Feb.)! Extends to Abyssinia and the East African mountains. Exsicc.—*Preuss* 807.

2. NEURADA Linn.—F.T.A. 2 : 381.

A woody tomentose annual with short spreading prostrate branches, the fruit persisting around the base of the stem; leaves pinnately lobulate or deeply toothed, rather long-petiolate, about 1·5 cm. long, densely white-woolly-tomentose; flowers axillary, solitary, roundish, surrounded with setiform bracteoles; fruit woody, orbicular, about 1·5 cm. diam., spinose .. .. *procumbens*

N. procumbens *Linn.*—F.T.A. 2 : 382; Chev. Bot. 253.
Mauritania. French Sudan: Timbuktu, dunes (July)! Exsicc.—*Charles* in *Herb. Chev.* 25505; 28765; 28884. *Chev.* 1343. Common in desert regions across N. Africa to India. (See Appendix).

3. RUBUS Linn.—F.T.A. 2 : 374.

Stems and lower surface of the leaves pilose-tomentose; leaves mostly trifoliolate; leaflets ovate-rotundate, cordate at the base, 4–6 cm. long, coarsely and doubly dentate, pilose above; stipules linear, 1·5 cm. long; panicles prickly, many-flowered, stout; calyx-lobes ovate-lanceolate, acuminate, 8 mm. long; petals usually absent; carpels glabrous .. .. 1. *apetalus*

Stems and lower surface of the leaves shortly pubescent or glabrescent; leaves mostly pinnate; leaflets not cordate; carpels pubescent:

Calyx-lobes narrowly triangular-lanceolate, ending in a glabrescent recurved hardened tip; prickles straight or nearly so .. .. 2. *fellatae*

Calyx-lobes ovate-lanceolate, with a long acuminate straight point; prickles curved 3. *pinnatus*

1. **R. apetalus** *Poir.*—F.T.A. 2 : 374. A bramble; fruit edible. N. Nigeria: Bauchi Plateau! Common on the mountains of Abyssinia, Uganda and East Africa. Exsicc.—*Lely* 731.
2. **R. fellatae** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8 : 18 (1907). Fruits red when ripe, edible.
French Guinea: Futa Jallon, 4,000 ft. (Apr., Sept.–Dec.)! Ivory Coast: Upper Sassandra, foot of Mt. Dou, 4,000 ft. (May)! Upper Nuon at Danané (Apr.). Exsicc.—*Chev.* 12905; 21481. (See Appendix).
3. **R. pinnatus** *Willd.*—F.T.A. 2 : 374. Climbing, 10–15 ft.; fruit edible.
Cameroons Mt.: 4,000–8,000 ft. (Feb., Dec.)! Fernando Po, 7,000 ft.! Also in St. Thomas Island, Spanish Guinea, Angola, East and South Africa and St. Helena. Exsicc.—*Mann* 295; 1221; 2026.

4. PYGEUM Gaertn.—F.T.A. 2 : 373.

Tree 30 ft. or more, resembling the Bird Cherry (*Prunus avium*); leaves elliptic or oblong, shortly acuminate, 8–13 cm. long, 3–5 cm. broad, crenate, glabrous, thinly coriaceous; lateral nerves 7–8 pairs; petiole 1–2 cm. long; flowers small in simple racemes shorter than the leaves arising from the lower part of the branchlets; pedicels spreading, up to 5 mm. long; petals woolly on the margin; fruit dry, depressed-globose, 1–1·5 cm. diam., glabrous, with a short style .. .. .. *africanum*

P. africanum *Hook. f.*—F.T.A. 2 : 373.
Cameroons Mt.: 7,000–7,500 ft. (Dec., Jan.)! Widely distributed in the mountainous parts of tropical Africa, extending south to Angola and Transkei (Cape Prov.). Exsicc.—*Mann* 1207; 2165.

5. CHRYSOBALANUS Linn.—F.T.A. 2 : 365.

Leaves orbicular to obovate-orbicular, usually widely emarginate at the apex, never acuminate, rounded or slightly cuneate at the base, 5–9 cm. long, 3·5–6 cm. broad, thick and leathery, glabrous, reticulate on both surfaces; petiole about 3 mm. long; flowers very few in axillary cymes, appressed-tomentose; bracts ovate; petals obovate, glabrous; filaments pilose; fruit indehiscent, obovoid, glabrous, about 2·5 cm. long; coast districts only .. .. 1. *orbicularis*

Leaves more or less acuminate, obovate to oblong, conspicuously narrowed to the base:

Leaves broadly obovate, shortly and obtusely acuminate, 5–10 cm. long, 3–5 cm. broad, closely reticulate and often shining, glabrous; flowers more numerous and smaller than above, often becoming galled; fruit obovoid, dehiscent from the base, ribbed, crustaceous; coast districts only .. .. 2. *ellipticus*

FIG. 123.—RUBUS APETALUS *Poir.* (ROSACEAE).

A, stipule. B, flower. C, carpel. D, longitudinal section of carpel. E, young fruit. F, seed.

Leaves oblong or oblong-elliptic, conspicuously acuminate, cuneate at the base, 7–12 cm. long, 3·5–5 cm. broad, obscurely reticulate, glabrous; flowers few and small, similar to those of *C. ellipticus*; fruit obovate, more or less 5-ribbed, pubescent when young; inland districts only .. .. 3. *atacorensis*

1. **C. orbicularis** *Schum. & Thonn.* Beskr. Guin. Pl. 232. *C. Icaco* Oliv.—F.T.A. 2: 365; Stapf 601; Holl. 2: 301; Chev. Bot. 250; not of Linn. A shrub or small tree of the coastal areas; flowers white or pinkish; fruit plum-like, deep red-purple.
Throughout the area, always near the sea; extending to Angola. Exsicc.—*Sieber* 31. *Brunner. T. Vogel* 8: 34. *Mann* 498 (partly). *Debeaux* 350. *Warnecke* 382. *Linder* 1425. (See Appendix).
2. **C. ellipticus** *Soland.*—F.T.A. 2: 366; Stapf 601; Chev. Bot. 250. A shrub or tree up to 30 ft. high, in habit and habitat like the preceding.
Senegal to Congo. Exsicc.—*Heudelot* 897. *Don. T. Vogel* 11; 97. *Ansell. Barter* 2100; 3235. *Mann* 498 (partly). *Sc. Elliot* 4181. *Whyte. Farmar* 356. *Linder* 1478. (See Appendix).
3. **C. atacorensis** *A. Chev.* in Bull. Soc. Bot. Fr. 58: Mém. 8d, 169. A shrub or tree up to 30 or 40 ft., branching low down.
Dahomey: Atacora Mts. 1,200–1,800 ft., between Natitingou and Bocorona, in forest galleries (June)! Exsicc.—*Chev.* 24175.

6. AFROLICANIA Mildbr. in Notizbl. Bot. Gart. Berl. 7 : 483 (1921).

A medium-sized tree; branchlets soon glabrous and purplish; leaves elliptic, cuneate at the base, acutely acuminate, 7–14 cm. long, 3–6 cm. broad, glabrous, laxly reticulate; petiole 5 mm. long; stipules subulate, persistent, 5–7 mm. long; inflorescence a slender terminal panicle; flowers very small, in small cymules on the main branches, softly tomentose; stamens about 20; fruit ovoid, 3–4 cm. long, warty *elaeosperma*

A. elaeosperma *Mildbr.* l.c. *Homalium Zenkeri* Gilg ex Mildbr. l.c. 484, name only. A tree with drooping branches and foliage, and greenish-white flowers.
Liberia: Grand Bassa; common (Feb.). S. Nigeria: Eket! Also in French Cameroons. Exsicc.—*Talb.* 3098. (See Appendix).

7. PARINARIUM Juss.—F.T.A. 2 : 366.

Leaves rounded to cuneate at the base (never cordate); basal glands usually conspicuous:
Leaves with few pairs (less than 10) of rather distant lateral nerves, at most laxly reticulate; flowers in broad terminal leafless corymbs; glands at the base of the leaf-blade:
Calyx-lobes glabrous outside; carpels 2–3; leaves ovate-elliptic, shortly acuminate, rounded and with 2 glands at the base, 8–13 cm. long, 3·5–8·5 cm. broad, glabrous, with 7–8 pairs of lateral nerves; calyx-tube (receptacle) curved and turbinate; lobes suborbicular, leathery; fruiting carpels mostly 3, obovoid, thinly pilose 1. *Kerstingii*
Calyx-lobes pubescent or puberulous outside (sometimes the outermost glabrous):
Leaves acuminate, usually cuneate at the base:
Leaves often mealy-puberulous all over the lower surface, 7–12 cm. long, 3·5–6 cm. broad; basal glands conspicuous; calyx-tube (receptacle) very shortly turbinate; fruiting carpels soon glabrous; branches of inflorescence pubescent or tomentose 2. *robustum*
Leaves glabrous below, elliptic, 6–11 cm. long, 3–4·5 cm. broad; basal glands obscure; calyx-tube (receptacle) rather long-turbinate; fruiting carpels densely warty-lenticellate; branches of inflorescence glabrous or minutely pubescent 3. *glabrum*
Leaves not or only very slightly pointed, mostly broadly rounded at the base, glabrous or with a few scattered hairs on the nerves, or rarely softly tomentellous below, 8–16 cm. long, 5–9 cm. broad; basal glands conspicuous; petiole very short and pubescent; fruits broadly ovoid-ellipsoid, 2–2·5 cm. long, puberulous 4. *polyandrum*
Leaves with 12 or more pairs of close parallel nerves with usually very prominent reticulation between; flowers mostly in leafy, more or less pyramidal panicles; glands in the middle of the petiole or very obscure:
Leaves rounded at the apex (not acuminate):
Inflorescence a rather close corymb shorter than the leaves; for further characters see below .. .. 9. *Benna*
Inflorescence a lax open many-flowered panicle; leaves oblong-elliptic, rounded or slightly cuneate at the base, 5–10 cm. long, up to 6·5 cm. broad, white-woolly-tomentose below and closely reticulate, with up to 20 pairs of prominent lateral nerves; flowers small, silky-tomentose; fruit ovoid, 3·5 cm. long 5. *curatellaefolium*
Leaves conspicuously acuminate:
Leaves elliptic or ovate-elliptic, at most rather shortly narrowed at the base, 5–12 cm. long, 3–5 cm. broad, rather long-petiolate, the petiole with a pair of glands near the middle, softly and shortly white-tomentose below; lateral nerves 20 or more pairs; flowers in a leafy terminal panicle; fruit obliquely ellipsoid, 3–4 cm. long .. .. 6. *excelsum*

Leaves lanceolate or narrowly oblong-lanceolate, narrowed from about the middle to the base, 5–8 cm. long, 2–3 cm. broad, with up to 15 pairs of lateral nerves; other characters as above, of which it may be merely a narrow-leaved form
7. tenuifolium

Leaves cordate at the base; basal glands usually obscure:
Inflorescence axillary and terminal, forming a leafy panicle at the end of the shoots, silky-pilose; older branchlets becoming glabrous and prominently lenticellate; leaves ovate-oblong, shortly acuminate, 5–10 cm. long, 2·5–5 cm. broad, softly tomentose below, with about 16–18 pairs of lateral nerves, at length glabrous or nearly so below; glands on the middle of the petiole, conspicuous; fruits ellipsoid, about 3 cm. long .. .. *8. subcordatum*
Inflorescence a terminal corymbose, shortly tomentose, much-branched cyme; branches softly tomentose; leaves broadly elliptic, rounded at the apex, 6–10 cm. long, 5–7 cm. broad, tomentellous below, with about 12 pairs of very prominent lateral nerves and strong close venation; petiole about 5 mm. long; young fruits ovoid, about 2 cm. long, slightly pubescent .. .. *9. Benna*
Inflorescence a terminal pyramidal, few-branched, tomentose panicle; branches hirsute; leaves ovate or elliptic, up to 25 cm. long and 15 cm. broad, shortly white-

FIG. 124.—PARINARIUM EXCELSUM *Sabine* (ROSACEAE).
A, base of leaf. B, flowering branch. C, longitudinal section of flower. D, pistil. E, fruit.

tomentose below and finely reticulate, with about 15–20 pairs of prominent lateral nerves spreading at the base; petiole very short; fruit ellipsoid, about 5 cm. long, finely warted .. .. *10. macrophyllum*

1. **Parinarium Kerstingii** *Engl.* Bot. Jahrb. 46 : 140, fig. 3. *P. Vassoni* A. Chev. Bot. 252, name only. *P. baoulense* A. Chev. Bot. 250, name only. A tall hard-wooded tree, 60–90 ft. high; flowers white with red stamens; fruit 1½ in. long.
Liberia: Gbanga (Sept.)! Ivory Coast: Yapo, in the forest (Oct.)! Bingerville; Assinie! Kodiokofi (Aug.)! Togo: Sokode-Basari, in fringing forest (fr. Feb., May)! Atakpame. N. Nigeria: Bauchi! lateau, common! Also in French Cameroons. Exsicc.—*Lely* 737. *Kersting* 320a; 547. *Linder* 538. *Chev.* 22329. (See Appendix).
2. **P. robustum** *Oliv.*—F.T.A. 2 : 370; Holl. 2 : 303; Chev. Bot. 252. A deciduous tree reaching in the forest 70–100 ft. in height and 12 ft. girth; fruit like a flattened plum, 2 in. long.
Ivory Coast: Dabou; Abidjean; Azaguié (Sept.)! Gold Coast: Abbontiakoon (July)! S. Nigeria: Lagos, Ikoyi (Dec., Feb., June)! Lagos Colony! Nun R. (fr. Sept.)! Benin (Apr., Nov.)! Onitsha! Abokam (Jan.)! Exsicc.—*Mann* 481. *Millen* 26. *Brown* 1. (See Appendix).
3. **P. glabrum** *Oliv.*—F.T.A. 2 : 370. A tree 30 or more feet high, with small buttresses; fruit ovoid, rough-skinned, about 1½ in. long.
Sierra Leone: Bobobu (June)! ? locality! Gold Coast: Abosso (Aug.)! Half Assinie (fr. July)! S. Nigeria: Awka! Also in French Cameroons, Spanish Guinea, Congo and Shari region. Exsicc.—*Chipp* 299. *Aylmer* 577. *Vigne* 981. *Thomas* 108. (See Appendix).
4. **P. polyandrum** *Benth.*—F.T.A. 2 : 370; Engl. l.c. 139–140 (incl. vars. *pleiocarpum* and *cinereum* Engl.); Holl. 2 : 303; Chev. Bot. 251. A fair-sized tree in the savannah forests, 10–20 ft. high in open country; flowers white in flattened corymbs; fruit deep red to black-purple.
French Sudan: Pénia, in scrub-land. Sierra Leone: Kambui-Kennema (Oct.)! Ivory Coast; S. Baoulé, between Toumodi and Dimbokro. Gold Coast: Ashanti, Masera (Apr.)! Ejura (fr. Aug.)! Juafoabotang, E. Prov. (June)! Yendi (fl. & fr. Feb.)! Togo: Sokode (fr. Apr., Oct.)! Dahomey: Zagnanado (Feb.)! Agouagon; Savalou. N. Nigeria: Nupe! Lokoja (fl. & fr. Mar.)! Kontagora (Feb.)! S. Nigeria: Idah

(Sept.) ! Ibode Bere (fr. May) ! Lagos, Ikoyi ! Extends to Cameroons and Upper Belgian Congo. Exsicc. —*T. Vogel* 3. *Barter* 1105. *Elliott* 39. *Thompson* 69. *McLeod* 814. *Aylmer* 252. *Dalz.* 278. *Foster* 23. *Kersting* 84 ; 690. (See Appendix).

5. **P. curatellaefolium** *Planch.*—F.T.A. 2 : 368 ; Holl. 2 : 302 ; Chev. Bot. 250. A small tree, 10–15 ft. in open country, 25 ft. or more in savannah forest, with pale foliage and dry pear-like edible fruit.
Common throughout the area in savannah and sometimes found in the open parts nearer the coast ; extending to French Cameroons, Shari, Eastern Sudan, Uganda and East Africa. Exsicc. *Heudelot* 362. *T. Vogel* 177. *Barter* 1106. *Sc. Elliot* 5108. *Rowland. Elliott* 224. *Dalz.* 86. *Foster* 24. *Pobéguin* 653. *Krause.* (See Appendix).

6. **P. excelsum** *Sabine.*—F.T.A. 2 : 367 ; Guill. & Perr. Tent. Fl. Seneg. 1 : 274, t. 62 ; Holl. 2 : 302 ; Chev. Bot. 251. *P. Elliottii* Engl. A large evergreen forest tree with pale tomentose branchlets and inflorescence ; bark grey with lenticels ; fruit rough-skinned, sometimes eaten.
In forests and on river banks from Senegal to Nigeria ; extending to Uganda and East Africa. Exsicc.—*Heudelot. Don. Barter* 885. *Sc. Elliot* 4998. *Sankey* 19. (See Appendix).

7. **P. tenuifolium** *A. Chev.* Veg. Util. Afr. Trop. Franç. 5 : 225 ; Bot. 252. A large forest tree.
Ivory Coast : Dabou (Feb.) ! Azaguie (Sept.) ! Bingerville ; Soubré, on the Sassandra R. Gold Coast : Subirisu (Feb.) ! Prestea (June) ! Obuase (Sept.) ! Exsicc.—*Chev.* 16204 ; 22295. *Thompson* 14. *Green* 899. *Vigne* 926. (See Appendix).

8. **P. subcordatum** *Oliv.*—F.T.A. 2 : 367 ; Chev. Bot. 252. A tree 40–50 ft. high ; on river banks and in fringing forests.
Sierra Leone : Dantilia (Mar.) ! Togo : Tamboma River ! Dahomey : Zagnanado. N. Nigeria : Nupe ! Abinsi ! Katsina Allah (Dec.) ! S. Nigeria : Enyon (Sept.) ! Also in Congo Basin and Ubangi. Exsicc.—*Barter* 1001 ; 1694. *Sc. Elliot* 4274. *Dalz.* 718. *Kersting* A. 683. (See Appendix).

9. **P. Benna** *Sc. Elliot* in Journ. Linn. Soc. Bot. 30 : 78. *P. Mobola* A Chev. Bot. 251, not of Oliv. A shrub or small tree 20 ft. high ; flowers white with pink centre.
Senegal : Kaolak ! French Guinea : several localities ! Sierra Leone : Talla Hills (Mar.) ! Bafodeya Hills (Apr.) ! Gold Coast : Nakwabi (Feb.) ! Exsicc.—*Sc. Elliot* 5052 ; 5480. *Farmar* 181 ; 228. *Dalz.* 8386. *Smythe* 269. *Caille* in *Herb. Chev.* 12487 ; 13068 ; 13069 ; 13164 ; 13536 ; 14824 ; 18108. *Kitson* 892. (See Appendix).

10. **P. macrophyllum** *Sabine.*—F.T.A. 2 : 369 ; Stapf 601 ; Holl. 2 : 303 ; Chev. Bot. 251. *P. senegalense* Guill. & Perr. Tent. Fl. Seneg. 1 : 273, t. 61. A shrub or fair-sized tree ; flowers crowded, white or pinkish ; fruit rough-skinned, edible.
Common from Senegal and Gambia to Sierra Leone ! Liberia : Monrovia ! Congo Town (July) ! N. Nigeria : Sokoto to Katagum, in the drier regions, flowering all the year ! Exsicc.—*Don. Döllinger. Brunner. Sieber. Perrottet. Ingram. Brown-Lester* 19. *Farmar* 303. *Whyte. Linder* 45. *Dalz.* 324. (See Appendix).

8. ACIOA Aubl.—F.T.A. 1 : 371, as *Griffonia* Hook. f. ; De Wild. in Bull. Jard. Bot. Brux. 7 : 188 (1920).

Calyx-tube glabrous or very shortly and thinly pubescent outside :
Bracteoles on the pedicels more or less ovate, entire, not or rarely slightly gland-toothed :
Inflorescence a simple raceme, rarely the racemes more than 1 in the leaf-axils ; the bracts usually much larger than the bracteoles :
Calyx-tube (receptacle) distinctly puberulous outside, 1·5 cm. long ; branchlets glabrescent ; leaves elliptic, cuneate at the base, 6–10 cm. long, 3·5–5 cm. broad, glabrous ; lateral nerves 4–5 pairs ; stipules subulate, entire ; flowers numerous, small ; staminal column 1·5–2 cm. long .. .. 1. *Barteri*
Calyx-tube (receptacle) quite glabrous outside :
Leaves cuneate at the base ; characters otherwise much as in *A. Barteri* 2. *scabrifolia*
Leaves rounded at the base :
Axis of inflorescence very short (about 1 cm. long) ; flowers few ; leaves ovate-lanceolate, gradually acuminate, 6–10 cm. long, 2·5–4 cm. broad, slightly hispid on the nerves ; lateral nerves 5–6 pairs ; stipules ovate-lanceolate, toothed at the base ; calyx-tube (receptacle) 1·5 cm. long .. 3. *Stapfiana*
Axis of inflorescence rather long (about 3 cm. long) ; flowers numerous, larger than above and on longer pedicels ; leaves, etc., more or less as in *A. Stapfiana* ; fruits broadly ovoid, 3 cm. long, tomentose .. .. 4. *Whytei*
Inflorescence a panicle ; the bracts scarcely larger than the bracteoles ; leaves broadly elliptic, slightly cuneate at the base, 12–16 cm. long, 5–8 cm. broad, glabrous ; lateral nerves 7 pairs ; stipules obliquely ovate, nervose ; calyx-tube (receptacle) up to 1·5–2 cm. long, puberulous ; staminal column 2·5 cm. long .. 5. *Mannii*
Bracteoles on the pedicels deeply gland-toothed or palmatisect :
Lateral nerves up to 8 pairs ; leaves ovate or shortly elliptic :
Bracteoles divided to the base, gland-tipped ; leaves ovate, rounded at the base, acutely acuminate, 6–11 cm. long, 4–5·5 cm. broad, long-pilose on the nerves below ; lateral nerves 6 pairs ; branchlets bristly hairy ; stipules very small ; axis of inflorescence 4 cm. long ; bracteoles laciniate nearly to the base, gland-tipped ; calyx-tube (receptacle) glabrous, 1·5 cm. long, falling away and leaving long peg-like persistent pedicels ; staminal column 1·5 cm. long .. 6. *parvifolia*
Bracteoles divided up to the middle :
Leaves rounded or subcuneate at the base, more or less elliptic, shortly acuminate, 7–13 cm. long, 4–6 cm. broad, pubescent on the nerves ; lateral nerves about 7 pairs ; bracteoles ovate, with short glandular teeth ; stipules linear-subulate ; branchlets with short hairs ; calyx-tube glabrous, 2·5 cm. long ; staminal column 2 cm. long .. .. 7. *Rudatisii*
Leaves subcordate at the base, oblong, abruptly acuminate, 6–10 cm. long, 3–4 cm.

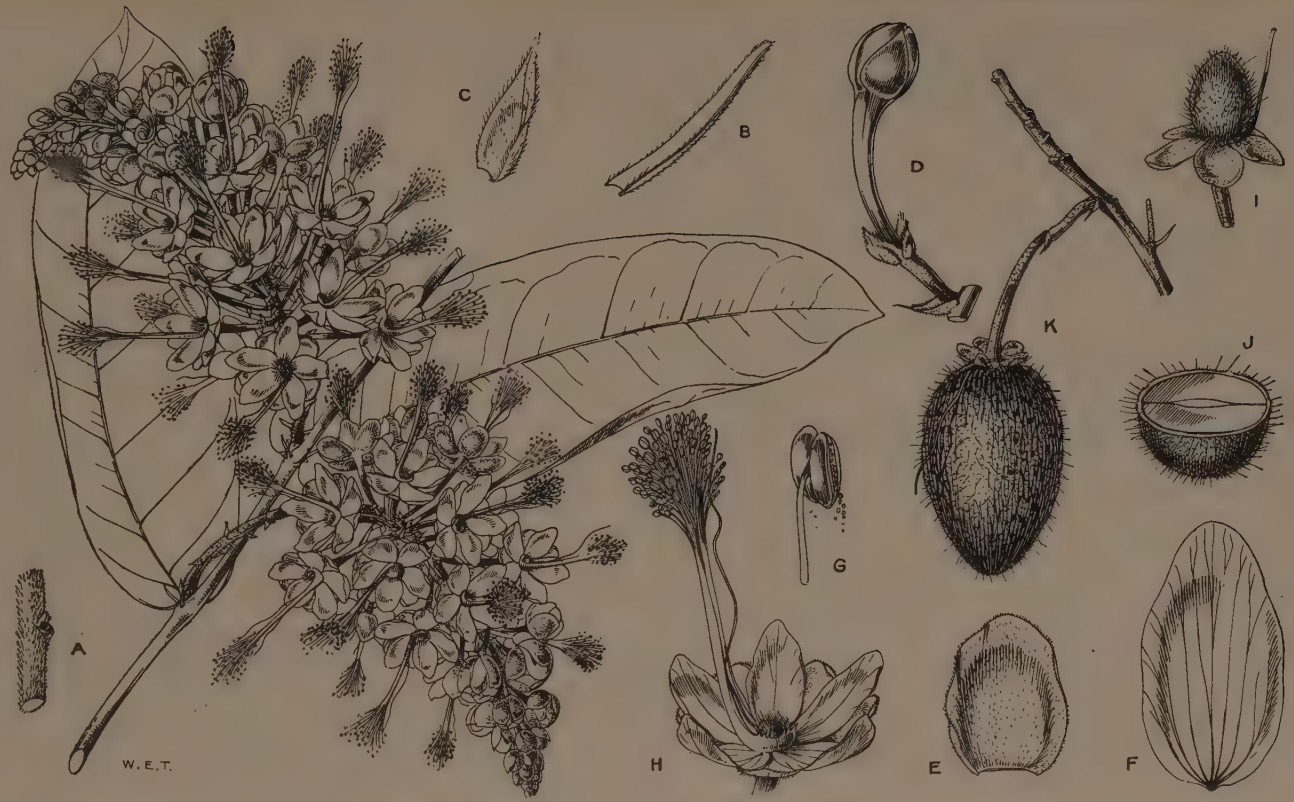

FIG. 125.—ACIOA PALLESCENS *Baill.* (ROSACEAE).

A, portion of stem showing leaf-scar and axillary bud. B, stipule. C, bract. D, flower-bud. E, sepal. F, petal. G, stamen. H, flower. I, young fruit. J, cross-section of same. K, mature fruit.

broad, the midrib with long spreading hairs ; bracteoles with long gland-tipped teeth ; branchlets spreadingly pilose ; calyx-tube glabrous, 2 cm. long ; staminal column 3 cm. long .. .. 8. *hirsuta*

Lateral nerves 10–16 pairs ; leaves elongate-oblong, cordate at the base, up to 30 cm. long and 10 cm. broad, glabrous or nearly so below ; stipules ovate or ovate-lanceolate, foliaceous ; branchlets with long spreading hairs ; bracteoles deeply palmatisect with gland-tipped segments ; calyx-tube (receptacle) 2·5–3·5 cm. long, glabrous ; staminal column 4 cm. long ; fruit ovoid, 6–7 cm. long, tomentose and bristly .. .. 9. *Klaineana*

Calyx-tube densely tomentose outside :

Leaves cordate at the base :

Midrib rather densely pubescent below ; hairs on the calyx-tube very short ; bracts and bracteoles conspicuous ; leaf-blades oblong-elliptic, abruptly acuminate, 10–15 cm. long, 5–7 cm. broad ; lateral nerves about 7 pairs ; stipules subulate ; calyx-tube 2–2·5 cm. long ; staminal column about 3·5 cm. long ; fruits ellipsoid, about 4 cm. long, tomentose with short hairs and also sparsely pilose with long hairs .. .. 10. *pallescens*

Midrib glabrous below ; leaves broadly oblong-elliptic, shortly acuminate, about 15 cm. long, 8–9 cm. broad, with about 7 pairs of lateral nerves ; calyx-tube 1 cm. long ; staminal column 2·5 cm. long, shortly pubescent .. .. 11. *eketensis*

Leaves rounded or slightly cuneate at the base ; hairs on the calyx-tube fairly long :

Inflorescence racemose :

Inflorescence lax-flowered, the axis about 10 cm. long ; bracts ovate-lanceolate, 5–6 mm. long, glabrous inside ; bracteoles ovate-lanceolate, conspicuous ; leaf-blades oblong-elliptic, 8–15 cm. long, 5–6·5 cm. broad ; midrib glabrescent ; lateral nerves 8 pairs ; stigmas ovate, long-acuminate ; calyx-tube 3 cm. long ; staminal column 3 cm. long .. .. 12. *Dinklagei*

Inflorescence rather close-flowered, the axis 3–4 cm. long ; bracts subulate ; about 2 mm. long, hairy all over ; bracteoles minute ; leaf-blades elliptic, acutely acuminate, 9–14 cm. long, 4–7 cm. broad ; midrib tomentose below ; lateral nerves about 10 pairs ; stipules lanceolate, short ; calyx-tube 2 cm. long ; staminal column 3 cm. long .. .. 13. *Talbotii*

Inflorescence dichotomously cymose ; leaves broadly elliptic, rounded at the base, shortly acuminate, up to 15 cm. long and 9 cm. broad, glabrous, with about 8 pairs of lateral nerves ; branchlets lenticellate ; calyx 1·5 cm. long, softly pubescent ; staminal column 2 cm. long .. .. 14. *dichotoma*

1. **Acioa Barteri** *Engl.* Bot. Jahrb. 26 : 382 ; De Wild. in Bull. Jard. Bot. Brux. 7 : 210. *Griffonia Barteri* Hook. f.—F.T.A. 2 : 373. *Acioa tenuiflora* Engl. & Dinkl. Stapf 602. A shrub or small tree with slender branches more or less climbing ; flowers white, fragrant ; fruit 1½ in. long, green, turgid, tubercled, more or less pear-shaped and pointed.
   Liberia : Grand Bassa ! Gbanga (Sept.) ! 8. Nigeria : Lagos, Ikoyi, etc. (Jan., Feb., Oct., fr. Mar.) ! Ijero (Nov.) ! Calabar (Jan.) ! Oban ! Eket ! Agolo ! Exsicc.—*Barter* 2183. *Millen* 44. *Thomson* 66. *Talb.* 1372 ; 1625 ; 3338. *Dinklage* 2101. *Linder* 613.
2. **A. scabrifolia** *Hua* in Bull. Mus. Hist. Nat. Par. 3 : 328 ; De Wild. l.c. 206 ; Chev. Bot. 252. *A. Lehmbachii* Engl. A small tree up to 20 or 30 ft. high ; flowers white, sometimes pink.
   French Guinea : ? locality ! Kouria, Bilima and neighbourhood (Dec.) ! Futa Jallon, several localities. Sierra Leone : Talla Hills, Ninia (Feb.) ! Kambui (Nov.) ! Jala Bai (Jan.) ! Liberia : Peahtah (Oct.) ! Cameroons Mt. : Buea ! Also in French Cameroons. Exsicc.—*Sc. Elliot* 4894. *Farmar* 265. *Aylmer* 214 ; 260. *Linder* 1117. *Lehmbach* 115. (See Appendix).
3. **A. Stapfiana** *De Wild.* l.c. 204. A shrub with lax branches, pubescent when young.
   Sierra Leone : Kafogo, Limba country (Apr.) ! Sherboro (Oct.) ! Exsicc.—*Sc. Elliot* 5521. *Garret.*
4. **A. Whytei** *Stapf* in Journ. Linn. Soc. Bot. 37 : 97 ; De Wild. l.c. 204 ; Stapf 602. A shrub or small tree, 20 ft. high, resembling the preceding but with larger flowers.
   Sierra Leone : ? locality ! Liberia : Monrovia ! Kakatown ! Moala (fr. Nov.) ! Exsicc.—*Whyte. Smythe* 241. *Linder* 1381.
5. **A. Mannii** *Engl.* Bot. Jahrb. 26 : 381 ; De Wild. l.c. 210. *Griffonia Mannii* Oliv.—F.T.A. 2 : 372. A climbing shrub, 15–20 ft., with glabrous branchlets.
   S. Nigeria : Johann-Albrechtshöhe (Jan., Mar.) ! Fernando Po ! Exsicc.—*Mann* 1427. *Staudt* 513.
6. **A. parvifolia** *Engl.* Bot. Jahrb. 26 : 380. *A. Unwinii* De Wild. l.c. 198. A hairy shrub, becoming more or less glabrous.
   Sierra Leone : Buri Town, on sea beach (Dec.) ! Ronietta (Nov.) ! Exsicc.—*Afzelius. Unwin & Smythe* 36. *Thomas* 5621.
7. **A. Rudatisii** *De Wild.* l.c. 215. A shrub ; branchlets brown-tomentose, becoming more or less glabrous.
   Cameroons Mt. : Buea ! Also in French Cameroons. Exsicc.—*Deistel* 654.
8. **A. hirsuta** *A. Chev.* ex *De Wild.* l.c. 200.
   Ivory Coast : Cavally Basin ; between Taté and Tabou (Aug.) ! Grabo (Aug.) ! Exsicc.—*Chev.* 19738 19818.
9. **A. Klaineana** *Pierre* ex *De Wild.* l.c. 196. A shrub or tree ; inflorescence copious, up to 6 or more inches long.
   S. Nigeria : Oban ! Eket ! Barombi ! Also in French Cameroons and Gabon. Exsicc. *Talb.* 1529 ; 3123 ; 3153. *Preuss* 263.
10. **A. pallescens** *Baill.* Adans. 7 : 224 ; De Wild. l.c. 207. *Griffonia pallescens* Oliv.—F.T.A. 2 : 372. A small tree or a shrub more or less climbing, with pale silky racemes of white flowers.
   S. Nigeria : Calabar (Feb.) ! Itu (Apr.) ! Cross River ! Oban ! Degema ! Johann-Albrechtshöhe ! Also in French Cameroons and Spanish Guinea. Exsicc.—*Mann* 2288. *Thomson* 2. *Holl.* 35. *Johnston. McLeod. Talb.* 1716. *Staudt* 618.
11. **A. eketensis** *De Wild.* l.c. 214. Branchlets glabrous.
   S. Nigeria : Eket ! Agege ! Exsicc.—*Talb.* 3239. *Kitson.*

12. **A. Dinklagei** *Engl.* Bot. Jahrb. 26 : 381 ; Stapf 601 ; De Wild. l.c. 211. A tall shrub with drooping tomentose branchlets and hoary racemes of white flowers.
Liberia : Grand Bassa (Sept.) ! Gold Coast : Sa on the Bonsa River, Tarkwa (Aug.) ! Exsicc.—*Dinklage* 2023. *Vigne* 973.
13. **A. Talbotii** *Bak. f.* Cat. Talb. Nig. Pl. 29 ; De Wild. l.c. 206. A small tree about 20 ft. high, with pale tomentose branchlets and brownish-velvety inflorescence.
S. Nigeria : Oban ! Exsicc.—*Talb.* 1533.
14. **A. dichotoma** *De Wild.* l.c. 216. Branchlets tomentose.
S. Nigeria : Eket, along the rivers ! Exsicc.—*Talb.* 3048.

79. CHAILLETIACEAE.

Small trees or shrubs, sometimes climbing. Leaves alternate, simple ; stipules present. Flowers small, mostly hermaphrodite, actinomorphic or slightly zygomorphic. Sepals 5, free or partially connate, imbricate. Petals mostly 2-lobed or 2-partite, free or united with the stamens into a tube. Stamens 5, alternate with the petals, free or united ; anthers 2-celled, opening lengthwise, the connective often dorsally thickened. Hypogynous glands opposite to the petals, free or connate. Ovary superior to quite inferior, 2-3-celled ; style mostly simple, 2-3-fid at the apex ; ovules 2 in each cell, pendulous. Fruit a drupe, dry or rarely fleshy, sometimes the epicarp splitting. Seeds without endosperm ; embryo large, straight.

A small tropical family with the aspect of some *Rosaceae ;* recognised by the usually bilobed petals ; peduncles sometimes adnate to the petiole.

Peduncle usually not adnate to the petiole ; fertile stamens 5 ; petals free or shortly united at the base, equal, usually bilobed .. .. 1. **Dichapetalum**
Peduncle adnate to the petiole ; fertile stamens 3, united with the petals into a tube, the petals unequal .. .. 2. **Tapura**

1. DICHAPETALUM Thouars—F.T.A. 1 : 339, as *Chailletia* DC.

Leaves with a close-felted indumentum below, often white, the hairs entirely covering the lower surface :
Midrib and lateral nerves below covered with long spreading hairs quite different from those on the lower surface ; leaves elliptic or oblong, shortly acuminate, unequally rounded at the base, 5–12 cm. long, 3–5 cm. broad, pubescent only on the nerves above, covered with whitish wool below ; lateral nerves about 7 pairs ; stipules subulate-filiform, up to 1 cm. long ; cymes short, crowded ; petals bilobed 1. *argenteum*
Midrib and lateral nerves below covered with similar hairs to those of the lower surface :
Inflorescence a large terminal paniculate cyme ; leaves elliptic-obovate, shortly acuminate, cordate at the base, 10–15 cm. long, 5–8 cm. broad, rather densely and softly pubescent below ; lateral nerves about 6 pairs ; panicles about 15 cm. long, softly tomentose ; flowers glomerulate on the branches, shortly pedicellate ; petals rather deeply bilobed .. .. 2. *Petersianum*
Inflorescence of small axillary and terminal cymes :
Peduncles longer than the cymes, $\frac{1}{3}$–$\frac{1}{2}$ as long as the leaves, the latter acutely caudate-acuminate, oblong-elliptic, rounded or cuneate at the base, 6–10 cm. long, 2·5–4 cm. broad, glabrous above, straw-coloured below ; lateral nerves 6–9 pairs, very prominent below ; flowers crowded, the peduncle often forked near the top ; petals glabrous, deeply bilobed .. .. 3. *Liberiae*
Peduncles as long as or shorter than the cymes ; leaves oblong-oblanceolate to obovate, acutely acuminate, obtuse at the base, 8–17 cm. long, 3–7 cm. broad, glabrous above, straw-coloured to glaucous below ; lateral nerves 7–8 pairs, prominent below ; flowers subumbellate on a simple peduncle ; petals bilobed, glabrous .. .. 4. *pallidum*
Leaves glabrous below, or at most somewhat laxly or rarely subdensely pubescent :
Leaves more or less distinctly cordate or auriculate at the base :
Branchlets hirsute or tomentose :
Leaves with a petiole about 1–1·5 cm. long ; petals pubescent outside ; leaf-blades broadly oblong-elliptic, acuminate, about 16 cm. long and 8–10 cm. broad, strongly and rather closely venose below ; cymes few-flowered, densely tomentose ; petals pubescent outside .. .. 5. *cordifolium*
Leaves subsessile :
Inflorescence pedunculate ; peduncle 0·5–2 cm. long ; flowers subsessile ; branchlets hirsute with brown hairs ; leaves obovate-elliptic, obtusely pointed, 6–10 cm. long, 4–5 cm. broad, spreadingly pilose on the nerves on both surfaces ; sepals spathulate, tomentose .. .. 6. *umbellatum*

Inflorescence sessile :
Flowers sessile or subsessile ; for description see below .. 12. *Heudelotii*
Flowers pedicellate ; branchlets tomentose ; leaves oblong-elliptic, shortly acuminate or obtuse, 5–15 cm. long, 2·5–6 cm. broad, laxly pubescent below, at length glabrous and rather strongly reticulate ; lateral nerves about 7 pairs ; flowers crowded ; petals bilobed ⅓ their length ; fruit obliquely ellipsoid, tomentose 7. *Johnstonii*
Branchlets glabrous or at most puberulous or soon becoming glabrescent :
Leaves at most shortly pointed, rounded to the cordate base ; flowering branchlets puberulous ; leaf-blades very broadly elliptic, 7–15 cm. long, 5–10 cm. broad, slightly pubescent on the nerves ; lateral nerves 5–7 pairs ; cymes very few-flowered and bracteate .. .. 8. *subcordatum*
Leaves long-acuminate, more or less narrowed to the auriculate base :
Flowering branchlets almost glabrous ; leaves obovate-elliptic, 10–16 cm. long, 5–8 cm. broad, glabrous below ; lateral nerves 6–8 pairs ; flowers in subsessile clusters, globose and tomentose in bud .. .. .. 9. *subauriculatum*
Flowering branchlets more or less pubescent ; leaves oblong-obovate, 8–15 cm. long, 3·5–6 cm. broad, setulose on the nerves below ; lateral nerves 4–5 pairs ; flower-clusters sessile ; flowers oblong, rusty-pilose in bud .. 10. *Linderi*
Leaves not cordate at the base (at most broadly obtuse or rounded) :
Inflorescence sessile or subsessile in the axils of the leaves, the flowers more or less glomerate :
Branchlets very hispid with spreading, rather long hairs or densely tomentose :
Flowers pedicellate, pedicels up to 3 mm. long ; leaves oblong-elliptic, acutely acuminate, 6–8 cm. long, 2–3 cm. broad, pilose on the nerves below ; lateral nerves 6 pairs, prominently looped and conspicuous below 11. *acutisepalum*
Flowers sessile :
Leaves rounded at the base :
Lateral nerves 5–6 pairs ; leaves oblong, acuminate, mucronate, rather narrow and subauriculate at the base, 7–14 cm. long, 2·5–4·5 cm. broad, glabrous below except on the nerves ; branchlets loosely tomentose 12. *Heudelotii*
Lateral nerves about 10 pairs ; leaves as above ; branchlets very densely tomentose .. .. 13. *scabrum*
Leaves cuneate and unequal-sided at the base, oblong, gradually acuminate, 11–15 cm. long, 4–5 cm. broad, loosely pubescent below ; lateral nerves about 8 pairs .. .. 14. *ferrugineum*
Branchlets glabrous or shortly appressed-pubescent :
Midrib hairy above ; leaves elliptic-obovate, obtusely acuminate but mucronate, markedly cuneate at the base, 10–22 cm. long, 5–10 cm. broad, slightly pubescent below ; flowers subsessile .. .. 15. *Rowlandii*
Midrib glabrous above ; leaves elongate-oblong, acuminate, very shortly cuneate at the base, 18 cm. long, 6–7 cm. broad, glabrous below ; lateral nerves 6–7 ; flowers few, crowded, distinctly pedicellate ; petals bilobed to the middle 16. *Thomsonii*
Midrib glabrous above ; leaves elliptic, obtusely acuminate, rounded at the apex, 12–15 cm. long, 6–7·5 cm. broad, leathery, glabrous ; lateral nerves 5–6 ; flowers numerous, clustered, with rather slender pedicels ; petals bilobed ⅓ their length 17. *obanensis*
Inflorescence distinctly stalked and cymose, sometimes adnate to the petiole :
Peduncles never adnate to the petiole :
Flowering branchlets glabrous ; leaves oblong-elliptic, obtusely acuminate, rather unequally cuneate at the base, 7–12 cm. long, 3–6 cm. broad, glabrous except on the nerves ; lateral nerves about 6 pairs ; cymes few-flowered, slender, hoary ; pedicels slender, jointed below the apex ; petals with a long slender claw, bilobed to about ¼ their length ; fruits oblanceolate, 3·5 cm. long, brown-tomentellous 18. *oblongum*
Flowering branchlets more or less pubescent or tomentose :
Petals entire or nearly entire ; leaves elliptic or slightly obovate-oblong, bluntly acuminate, rounded at the base, 7–12 cm. long, 4–7 cm. broad, glabrous ; lateral nerves 5–6 pairs ; cymes small and few-flowered, hoary ; pedicels stout, jointed at the apex .. .. 19. *Barteri*
Petals more or less deeply bilobed :
Inflorescence more or less openly cymose or paniculate :
Pedicels much shorter than the flowers :
Leaves large, broadly elliptic or obovate, over 15 cm. long and 9 cm. broad ; cymes large and lax, very many-flowered ; petals bilobed ⅓ of their length 20. *floribundum*
Leaves usually much smaller, rarely up to 15 cm. long ; cymes mostly smaller :
Leaves pubescent below (rarely nearly glabrous) ; flowers 5-merous ; leaf-

blades obovate-elliptic to oblanceolate, shortly obtusely acuminate, 8–12 cm. long, 3–6 cm. broad; lateral nerves 5–6 pairs; cymes short, dense-flowered; pedicels very short .. .. 21. *flexuosum*

Leaves glabrous below; flowers 4-merous; leaf-blades oblong-elliptic, acutely acuminate, subacute at the base, 7–12 cm. long, 3–5 cm. broad; lateral nerves about 6 pairs, prominently looped; flowers very small, shortly tomentellous, in rather lax cymes .. .. .. 22. *Zenkeri*

Pedicels equal to or longer than the flowers, jointed below the top; leaves

FIG. 126.—DICHAPETALUM TOXICARIUM *Engl.* (CHAILLETIACEAE).

A, flower. B, longitudinal section of flower. C, petal. D, stamen. E, pistil showing glands. F, fruit. G, cross-section of fruit.

oblong-oblanceolate or obovate-oblong, acutely acuminate, 6–12 cm. long, 2–5 cm. broad, glabrous and shining below; lateral nerves about 6 pairs, very prominently looped; cymes slender, rather few-flowered 23. *cymulosum*

Inflorescence subcapitate, the pedicels crowded at the apex of a fairly long peduncle:

Leaves pubescent more or less all over the lower surface, obovate-elliptic, acutely acuminate, 8–13 cm. long, 3·5–5·5 cm. broad; lateral nerves 8 pairs; peduncles 2–5 cm. long; pedicels jointed well below the top 24. *tomentosum*

More or less as above but leaves pubescent only on the nerves below 25. *acutifolium*

Peduncles (or at least the upper ones) adnate to the petiole :
Flowering branchlets glabrous or nearly so, sometimes puberulous :
Lower peduncles free from the petiole ; leaves oblong or elliptic, obtusely acuminate, cuneate at the base, reticulate, 10–15 cm. long, 4–6 cm. broad, glabrous ; flowers in very small shortly pedunculate cymes ; fruits ellipsoid, 3–4 cm. long, hoary .. .. 26. *toxicarium*
Lower peduncles adnate to the petiole ; leaves oblong-elliptic, abruptly and shortly acuminate, shortly cuneate at the base, 4–8 cm. long, 2–4 cm. broad, glabrous, shining on the upper surface ; flowers very small in rather lax cymes ; petals bilobed to ⅓ their length .. .. 27. *chrysobalanoides*
Flowering branchlets rusty-hirsute or tomentose :
Leaves glabrous or nearly so ; flowers subfasciculate at the apex of the petiole ; leaf-blades oblong-elliptic, obliquely acuminate, 9–15 cm. long, 4–8 cm. broad, reticulate ; lateral nerves about 5 pairs, prominently looped ; fruit ellipsoid, long-beaked, tomentellous, about 3 cm. long .. .. 28. *Rudatisii*
Leaves rather densely pubescent below ; cymes pedunculate at the apex of the petiole ; leaf-blades oblong-elliptic, obliquely acuminate, 9–15 cm. long, 3·5–6 cm. broad ; lateral nerves 8–9 pairs, very prominent below ; stipules 1 cm. long, pectinately divided ; young fruits globose, softly and densely tomentose .. .. 29. *angolense*

1. **Dichapetalum argenteum** *Engl.* Bot. Jahrb. 33 : 82. *Chailletia rufipilis* Oliv.—F.T.A. 1 : 342, partly, not of Turcz. A climbing shrub, up to 15–20 ft. long.
S. Nigeria : Cameroons River (Jan.) ! Also in French Cameroons and Gabon. Exsicc.—*Mann* 747.
2. **D. Petersianum** *Dinkl. & Engl.* in Engl. Bot. Jahrb. 46 : 572. An erect shrub with more or less pendulous branchlets, softly tomentose.
Liberia : Grand Bassa (Aug.) ! Monrovia. Exsicc.—*Dinklage* 1970.
3. **D. Liberiae** *Engl. & Dinkl.* in Engl. Bot. Jahrb. 33 : 84 ; Chev. Bot. 120. *D. albidum* A. Chev., name only. *Chailletia Whytei* Stapf in Johnston, Liberia 2 : 586. A shrub, erect or half climbing ; branchlets pale yellowish tomentose.
French Guinea : Kindia ; Kouria, on the banks of the Konkouré. Liberia: Grand Bassa (May) ! Kakatown ! Ivory Coast : Grabia (June) ! Dahomey : near Sakété. Exsicc.—*Dinklage* 1832. *Whyte. Chev.* 19159.
4. **D. pallidum** *Engl.* Bot. Jahrb. 46 : 570 ; Chev. Bot. 121. *D. cinereum* Engl. ; *D. Warneckei* Engl. ; *D. Bussei* Engl. ; *Chailletia pallida* Oliv.—F.T.A. 1 : 343. A shrub or small tree, erect or more or less scandent, with pale ochraceous-tomentose branchlets ; fruit ovoid or subglobose, 1–1¼ in. long, densely yellowish tomentose.
French Guinea : Konanké country (Feb.) ! Sierra Leone : various localities ! Liberia : Gbanga ! Ivory Coast ; Songan, in Indénié (Mar.) ! Togo : Lome (Nov., Dec.) ! Kpeme (fl. and fr. Jan.) ! Dahomey ; Abomey ; Zagnanado, on the banks of the Lower Ouémé ; Ouidah. S. Nigeria : Lagos Colony, near Awta ! Epe ! Apapa (Dec.) ! Also in French Cameroons and Gabon. Exsicc.—*Barter* 3299. *Thomas* 1604 ; 3476 ; 5190. *Moloney. Millen* 5. *Dalz.* 1336. *Chev.* 17690 ; 20826. *Warnecke* 13. *Busse* 3639. *Linder* 674 ; 897. (See Appendix).
5. **D. cordifolium** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A shrub with densely tomentose branchlets and inflorescence, and rather large leaves.
S. Nigeria : Akure ! Exsicc.—*Foster* 192.
6. **D. umbellatum** *Chod.* in Bull. Herb. Boiss. 3 : 671. A woody climber with short branchlets spreading at right angles.
S. Nigeria : Ajilite, in forest ! Also in Portuguese Congo and Angola. Exsicc.—*Millen* 167.
7. **D. Johnstonii** *Engl.* Bot. Jahrb. 23 : 141. A shrub, sometimes climbing ; young branchlets densely rusty-tomentose, becoming glabrous ; inflorescence close-clustered.
S. Nigeria : Ebute Metta (Nov.) ! Cross River (Apr.) ! Oban ! Eket ! Exsicc.—*Johnston. Millen* 22. *Talb.* 1383 ; 1763. (See Appendix).
8. **D. subcordatum** *Engl.* Bot. Jahrb. 46 : 570. *Chailletia subcordata* Hook. f.—F.T.A. 1 : 341. A shrub about 15 ft. high, with puberulous branchlets and fairly large leaves.
Fernando Po (June, Nov.) ! Exsicc.—*T. Vogel* 207. *Mann* 432.
9. **D. subauriculatum** *Engl.* l.c. 583. *Chailletia subauriculata* Oliv.—F.T.A. 1 : 344. A shrub 6–8 ft. high ; branchlets slightly puberulous, becoming soon glabrous.
S. Nigeria : Calabar (Feb.) ! Exsicc.—*Mann* 2260.
10. **D. Linderi** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. Low bush ; flowers yellowish.
Liberia : Suen (Nov.) ! Exsicc.—*Linder* 1407.
11. **D. acutisepalum** *Engl.* Bot. Jahrb. 23 : 140. A rusty-hairy shrub.
Sierra Leone : near Kurusu (Apr.) ! Exsicc.—*Sc. Elliot* 5526.
12. **D. Heudelotii** *Engl.* Bot. Jahrb. 46 : 592 ; Chev. Bot. 120. *Chailletia Heudelotii* Planch.—F.T.A. 1 : 344. A shrub ; branchlets and young leaves rusty-hairy.
Senegal : ? locality ! Sierra Leone : Bagroo River (Apr.) ! Exsicc.—*Heudelot* 770. *Mann* 800. *Thomas* 10212 ; 10376 ; 10551.
13. **D. scabrum** *Engl.* l.c. 33 : 86. A climbing shrub ; branchlets velvety-tomentose.
S. Nigeria : Johann-Albrechtshöhe (Jan.) ! Exsicc.—*Staudt* 542.
14. **D. ferrugineum** *Engl.* Bot. Jahrb. 23 : 139. A shrub with densely rusty-tomentose branchlets.
S. Nigeria : Victoria (May) ! Exsicc.—*Preuss* 1275.
15. **D. Rowlandii** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *D. Bocageanum* A. Chev. Bot. 119, not of Engl. A shrub, climbing ?
Dahomey : Porto Novo (Mar.) ! S. Nigeria : west of Lagos Colony ! Exsicc.—*Rowland. Chev.* 23332.
16. **D. Thomsonii** *Engl.* Bot. Jahrb. 46 ; 585. *Chailletia Thomsoni* Oliv.—F.T.A. 1 : 342. A small tree.
S. Nigeria : Calabar ! Exsicc.—*Thomson* 79.
17. **D. obanense** *Bak. f.* mss. *D. Thomsonii* Engl. var. *obanensis* Bak. f. in Talb. Cat. Nig. Pl. 19. A shrub or small tree like the last.
S. Nigeria : Oban ! Exsicc.—*Talb.* 1627.
18. **D. oblongum** *Engl.* l.c. 568 ; Chev. Bot. 121. *Chailletia oblonga* Hook. f.—F.T.A. 1 : 342. A shrub.
Ivory Coast : Aboisso ; Sassandra Port ; Alépé ; between Grabo and Taté ! Fernando Po (Nov., Dec.) ! Also in Gabon. Exsicc.—*T. Vogel* 36 ; 36b ; 113. *Ansell. Barter* 2056. *Mann* 46.
19. **D. Barteri** *Engl.* Bot. Jahrb. 23 : 134. A small tree with rusty-pubescent branchlets.
S. Nigeria : Onitsha ! Also in French Cameroons. Exsicc.—*Barter* 1781.
20. **D. floribundum** *Engl.* Bot. Jahrb. 46 : 570. *Chailletia floribunda* Planch.—F.T.A. 1 : 340. *D. floribundum* var. *Preussii* Engl. A shrub, often climbing, with grey or ochrey-puberulous branchlets.
Cameroons Mt. : Buea ! Fernando Po (June, Nov., Dec.) ! Exsicc.—*T. Vogel* 105 ; 137 ; 175. *Barter* (no number). *Mann* 16. *Dunlap* 155. *Preuss* 904.

21. **D. flexuosum** *Engl.* l.c. 568. *Chailletia flexuosa* Oliv. A shrub or small tree with yellowish or rusty-tomentose branchlets and small white fragrant flowers; fruit yellow-tomentose, about ¾ in. long.
Sierra Leone: Kafogo (Apr.)! Ivory Coast: several localities! Gold Coast: Achimota (Apr.)! Togo: Lome (Nov.)! Dahomey: Abomey! S. Nigeria: Lagos! Abeokuta! Ibadan! Ogbomosho! Also in Congo Basin. Exsicc.—*Barter* 2142; 3355; 3372. *Irving. Rowland. Sc. Elliot* 5601b; 5935. *Brown* 935. *Farmar* 468. *Schlechter* 13027. *Mildbraed* 7482. *Chev.* 17016; 17173; 21549; 22504; 23266. (See Appendix).
22. **D. Zenkeri** *Engl.* Bot. Jahrb. 23: 138. A climbing shrub; branchlets yellowish-tomentellous, becoming glabrous; flowers small, white, fragrant.
S. Nigeria: Oban! Also in French Cameroons, Gabon and Congo. Exsicc.—*Talb.* 1360; 1631.
23. **D. cymulosum** *Engl.* Bot. Jahrb. 46: 570; Chev. Bot. 120. *Chailletia cymulosa* Oliv.—F.T.A. 1: 340. A shrub, sometimes climbing; branchlets pubescent, becoming glabrous; fruit plum-like, 1–1½ in. long, glabrous.
Ivory Coast: Agniéby Valley, in forest; Dabou; Bingerville. S. Nigeria: Cameroons River (Jan.)! Exsicc.—*Mann* 2200. *Chev.* 17096; 17165; 17329.
24. **D. tomentosum** *Engl.* Bot. Jahrb. 23: 138. A much-branched woody climber, rusty-pilose; fruit obliquely ovoid, about 1 in. long, rusty-tomentose.
S. Nigeria: Barombi (Apr.)! Also in Gabon. Exsicc.—*Preuss* 55. (See Appendix).
25. **D. acutifolium** *Engl.* l.c. 136. A climbing shrub very like the preceding.
S. Nigeria: Victoria (Apr.)! Exsicc.—*Preuss* 1103. (See Appendix).
26. **D. toxicarium** *Engl.* Bot. Jahrb. 46: 570; Chev. Bot. 121. *D. suboblongum* Engl., partly. *Chailletia toxicaria* G. Don.—F.T.A. 1: 341; Holl. 1: 156. A shrub or small tree, glabrous except for the hoary inflorescence.
Senegal: ? locality! French Guinea: Konakry! Sierra Leone: various localities, common! Ivory Coast: various localities! Gold Coast: Axim! Also in Gabon. Exsicc.—*Heudelot* 691; 814. *Pobéguin* 2017. *T. Vogel* 100. *Mann* 826. *Sc. Elliot* 3889; 4401, etc. (See Appendix).
27. **D. chrysobalanoides** *Hutch. & J. M. Dalz.* in Kew Bull. 1928. ined.
Sierra Leone: Magbile (Dec.)! Exsicc.—*Sc. Elliot* (no number). *Thomas* 6016; 6019; 6110; 6119; 6125; 6145.
28. **D. Rudatisii** *Engl.* l.c. 582. A shrub erect or climbing.
S. Nigeria: Degema! Oban! Also in French Cameroons. Exsicc.—*Talb.* 19; 482.
29. **D. angolense** *Chod.* in Bull. Herb. Boiss. 3: 672. *D. ferrugineo-tomentosum* Engl. Shrub up to 12 ft.
Ivory Coast: Abidjean, Dabou! Cameroons Mt.: Buea, 3,000 ft. (Jan.)! Extends to Angola. Exsicc. —*Chev.* 15560 bis. *Dunlap* 157.

2. TAPURA Aubl.—F.T.A. 1: 344.

Tree 20 ft. high; branchlets slightly pubescent; leaves obovate-elliptic, abruptly acuminate, shortly cuneate at the base, 10–15 cm. long, 4–7 cm. broad, puberulous only on the nerves below, laxly reticulate; lateral nerves 3–4 pairs; flowers small, clustered, shortly pedicellate, the peduncle completely adnate to the petiole; sepals laxly pubescent .. .. *africana*

T. africana *Oliv.*—F.T.A. 1: 344.
Fernando Po! Exsicc.—*Mann* 1161.

80. CAESALPINIACEAE.

Trees, shrubs or very rarely herbs or scramblers. Leaves pinnate or bipinnate, rarely simple or 1-foliolate; stipels mostly absent. Flowers mostly showy, racemose, spicate or rarely cymose, zygomorphic, rarely subactinomorphic; bracteoles sometimes large and enclosing the flower in bud. Sepals 5, or the two upper connate, mostly free, imbricate or rarely valvate, sometimes much reduced and then replaced by the large bracteoles. Petals 5 or fewer or absent, the adaxial (upper) one inside in bud, the others variously imbricate. Stamens mostly 10, rarely numerous, free or variously connate; anthers various, sometimes opening by terminal pores. Ovary superior, 1-celled, of 1 carpel. Seeds with or without endosperm and large embryo.

Mainly tropical and subtropical; recognised amongst its allies by the adaxial petal being inside the others in bud. A large number of the African genera have a much-reduced calyx, a condition then compensated for by the large pair of opposite valvate bracteoles which completely envelop the flower in bud. These bracteoles may easily be mistaken for a true calyx.

The following are generally cultivated: *Delonix regia* Raf. (*Poinciana regia* Boj.), a native of Madagascar and known as "Flamboyant"; *Haematoxylon campechianum* Linn., the "Logwood," from tropical America.

Leaves simple:
Ovary and fruit long-stipitate; leaves undivided; flowers in pyramidal racemes, at length reflexed; fruits 2-valved, tough but somewhat bladder-like .. 1. **Bandeiraea**
Ovary and fruit sessile or nearly so; leaves more or less bilobed; inflorescence various; fruits flat, not bladder-like .. .. 2. **Bauhinia**
Leaves compound, sometimes reduced to a pair of leaflets, very rarely to 1 leaflet (then pulvinate at the base):

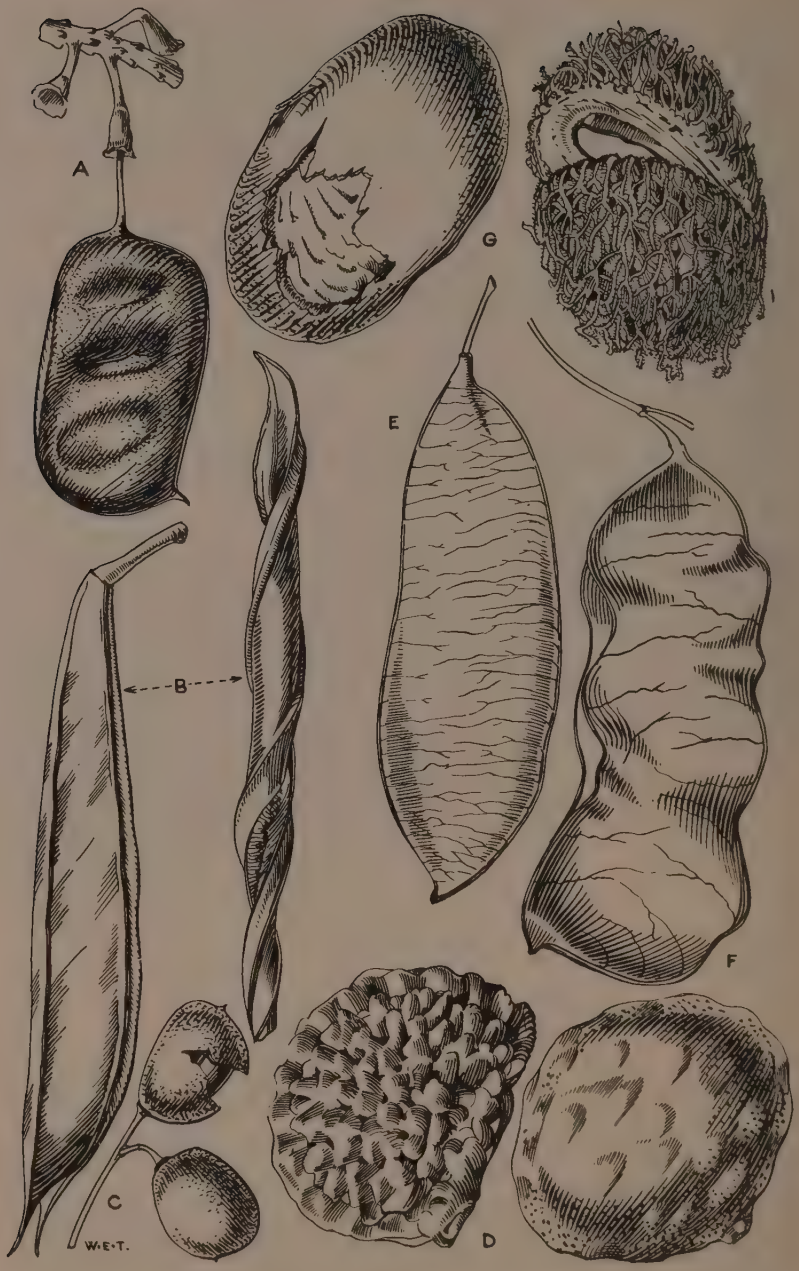

FIG. 127.—FRUITS OF CAESALPINIACEAE.

A, BANDEIRAEA SIMPLICIFOLIA *Benth.* B, OLIGOSTEMON PICTUS *Benth.* C, DIALIUM GUINEENSE *Willd.* D, CYNOMETRA MEGALOPHYLLA *Harms.* E, DISTEMONANTHUS BENTHAMIANUS *Baill.* F, CRUDIA SENEGALENSIS *Planch. ex Benth.* G, DETARIUM SENEGALENSE *Gmelin.*

Leaves once pinnate :
Bracteoles [1] small, or if larger, then either petaloid or not enclosing the flower in bud and not simulating a calyx :
Petals present (sometimes considerably reduced) :
Sepals very imbricate in bud :
Leaves with an odd terminal leaflet (imparipinnate), never 1-foliolate :
Stamens 4–5 ; inflorescence a stout simple raceme or panicle of racemes ; sepals 4, one largest and encircling the others in bud ; leaflets large ; fruits dehiscent, with a ridge near the margins of each valve .. .. 3. **Oligostemon**
Stamens 2 ; inflorescence a panicle of cymes ; sepals 5, subequal ; leaflets fairly small ; fruits drupaceous, indehiscent, rounded, velvety .. 14. **Dialium**
Leaves without an odd terminal leaflet (paripinnate), rarely 1-foliolate :
Anthers attached at the middle, never opening by pores :
Stamens 10 or more :
Sepals free to the base or nearly so ; flower-buds more or less globose ; bracteoles small and inconspicuous ; ovules usually 2 4. **Cynometra**
Sepals united at the base into a tube ; flower-buds obovoid :
Bracteoles small and inconspicuous, not petaloid :
Petals equal ; ovules 4–5 .. .. 5. **Schotia**
Petals unequal, 3 larger and 2 smaller ; ovules 2–3 .. .. 6. **Loesnera**
Bracteoles large and petaloid ; ovules 2 .. .. .. 7. **Hymenostegia**
Stamens 3, connate below ; ovules numerous .. .. 8. **Tamarindus**
Anthers attached at or near the base, often opening by terminal pores ; ovules numerous .. .. 9. **Cassia**
Sepals valvate in bud or rarely slightly imbricate only at the base :
Stamens 10 ; anthers opening by longitudinal slits :
Flowers large, few, clustered at the tips of the twigs ; stamens united only at the base ; style terminal .. .. 10. **Baikiea**
Flowers medium-sized to rather small ; stamens united below into a sheath ; style lateral .. .. 11. **Tessmannia**
Flowers very small, on slender spikes .. .. .. 13. **Oxystigma**
Stamens 2 ; anthers opening by terminal pores ; flowers in lax paniculate cymes .. .. 12. **Distemonanthus**
Petals absent :
Sepals 5 :
Stamens 10 ; inflorescence a panicle of long slender racemes 13. **Oxystigma**
Stamens 2 ; inflorescence a panicle of cymes .. .. 14. **Dialium**
Sepals 4 :
Stipules long and linear, spirally folded around the apical bud ; inflorescence covered in bud by numerous dry striate bracts ; fruits flat, 1–2-seeded 15. **Hylodendron**
Stipules not as above, either broad and foliaceous or small and early deciduous :
Inflorescence a simple axillary or terminal slender raceme ; pedicels slender :
Stipules large, foliaceous, subpersistent ; petiolules twisted ; ovary densely woolly .. .. 16. **Crudia**
Stipules early caducous ; petiolules not twisted :
Leaflets opposite ; racemes not spiciform ; fruits not known 17. **Talbotiella**
Leaflets alternate ; racemes spiciform ; fruit 1-seeded, with a long basal wing .. .. 18. **Gossweilerodendron**
Inflorescence paniculate ; stipules small or early deciduous ; petiolules not twisted :
Ovary sessile ; fruits drupaceous .. .. 19. **Detarium**
Ovary stipitate ; fruits not drupaceous .. .. .. 20. **Copaifera**
Bracteoles large, opposite, valvate, not petaloid, or if so, then calyx obsolete, enclosing the flower in bud and often resembling a calyx, the latter mostly reduced or obsolete :
Stamens very numerous ; anthers deeply sagittate ; bracteoles with a gland-like knob at the apex ; sepals 4, silky-villous outside .. 21. **Polystemonanthus**
Stamens up to 15 :
Calyx obvious :
Petals subequal, scarcely exceeding the calyx ; flowers subsessile 22. **Isoberlinia**
Petals very unequal, the posterior often much larger than the rest or only 1 petal present :
Posterior petal or petals sessile .. .. 23. **Daniellia**
Posterior petal or petals with a more or less long claw :
Fertile stamens 10–5 :
Leaflets small, opposite, in 10 or more pairs, deeply auriculate on the lower side ; petal 1, clawed .. .. 24. **Monopetalanthus**

[1] In *Hylodendrum* the primary *bracts* cover the inflorescence in bud.

Leaflets medium-sized to large, not markedly auriculate :
All petals developed :
Three petals subequal and larger than the other two .. .. 6. **Loesenera**
One petal larger than the others and often bilobed ; flowers pedicellate 25. **Berlinia**
One petal only fully developed, the others minute or absent .. 26. **Afzelia**
Fertile stamens 3 .. .. 27. **Macrolobium**
Calyx obsolete or very rudimentary :
Petals well developed ; flowers in short racemes, with very slender pedicels ; young shoots covered by imbricate tomentose scales .. 28. **Cryptosepalum**
Petals minute :
Panicles more or less pyramidal ; pedicels stout .. .. 29. **Brachystegia**
Panicles elongated ; pedicels slender .. .. 30. **Didelotia**
Leaves twice pinnate :
Sepals free to the base or nearly so :
Common petiole normally developed, not ending in a spine ; rhachis not leaf-like :
Branchlets and often the leaf-rhachis prickly :
Fruits flat and thin, with an intramarginal nerve, not prickly ; stipules small and inconspicuous .. .. 31. **Mezoneurum**
Fruits not quite flat, densely prickly ; stipules leafy, bilobed, usually persistent 32. **Caesalpinia**
Branchlets and leaf-rhachis not prickly ; stipules deciduous :
Fruit dehiscent, woody, not winged, valves becoming recurved ; leaflets (in ours) alternate .. .. 33. **Bussea**
Fruit indehiscent, flat and almost winged ; leaflets opposite 34. **Peltophorum**
Common petiole very short, ending in a sharp spine ; rhachis of pinnae flat and leaf-like, leaflets very small .. .. 35. **Parkinsonia**
Sepals connate into a campanulate tube :
Fruit flat and indehiscent ; flowers sessile ; ovules 1–2 .. .. 36. **Burkea**
Fruit dehiscent, 2-valved ; flowers very shortly pedicellate ; ovules 5 or more 37. **Erythrophleum**

1. BANDEIRAEA Welw.—F.T.A. 2 : 284.

Calyx-tube softly tomentose outside, about 1 cm. long ; leaves more or less ovate rounded or widely cordate at the base, rounded or shortly obtusely acuminate at the apex, 6–12 cm. long, 3–6 cm. broad, glabrous and shining, prominently 3-nerved at the base ; inflorescence softly tomentose, with a curled hook-like branch at the base ; fruits obliquely oblong, inflated, up to 4–5 cm. long, blackish and reticulate ; stipe slender, 1–1·5 cm. long, pubescent .. .. 1. *simplicifolia*
Calyx-tube glabrous outside, about 3 cm. long ; leaves oblong-elliptic, a little cuneate at the base, slightly acuminate at the apex, 6–14 cm. long, 3–6 cm. broad, glabrous, less prominently 3-nerved at the base ; inflorescence glabrous, without a modified branch at the base ; fruits probably smaller than above, but otherwise similar 2. *tenuiflora*

1. **B. simplicifolia** *Benth.*—F.T.A. 2 : 285 ; Chev. Bot. 228. *Griffonia simplicifolia* Baill. Adans. 6 : t. 2, 1. A hard-wooded shrub, usually climbing, with greenish flowers and inflated black pods.
Ivory Coast : Bouroukrou : Sassandra Port ; between Toumodi and Dimbokro. Gold Coast : common in scrub and secondary forest (fl. and fr. Sept.–Nov.) ! Togo : Lome (Nov.) ! S. Nigeria : Epe (Feb.) ! Ijebu Ode (Aug.) ! Also in Gabon. Exsicc.—*Millen* 158. *Johnson* 475. *Moloney*. *Mildbraed* 7510. *Warnecke* 231. *Brass*. (See Appendix).
2. **B. tenuiflora** *Benth.*—F.T.A. 2 : 285. A climbing shrub. 15–20 ft.
S. Nigeria : Johann-Albrechtshöhe ! Fernando Po ! Also in French Cameroons and Gabon. Exsicc.—*Mann* 1163. *Staudt* 951.

2. BAUHINIA Linn.—F.T.A. 2 : 285.

Leaves very small, bilobed almost to the base, rarely over 2 cm. long, lobes semicircular, glaucous, glabrous ; petiole about ⅓ as long as the leaf ; racemes few-flowered ; calyx spathaceous, the limb twice as long as the tube, finely puberulous ; petals spathulate ; stamens 10, all perfect, filaments hairy at the base ; anthers thinly pilose ; ovary long-stipitate, glabrous ; fruit linear, curved, obliquely constricted, 6–9 cm. long, glabrous .. .. 1. *rufescens*
Leaves larger, not lobed beyond the middle :
Leaves not markedly reticulate below, thinly chartaceous, laxly pubescent or nearly glabrous below, each half obliquely elliptic, rounded at the apex, 4–5 cm. long, more or less glaucous below ; flowers large and showy, few ; ovary very shortly stipitate, softly tomentose ; fruit linear, flat, softly tomentose, about 10 cm. long 2. *tomentosa*
Leaves very strongly reticulate below, rigidly leathery :
Leaves pubescent between the veins ; fruits broadly or narrowly oblong, stipitate, about 15 cm. long and 5 cm. broad, at first densely and softly tomentose ; leaf-blades truncate to cordate at the base, bilobed for about ¼ their length, 7–15 cm. long, up to 12 cm. broad, digitately 12–14-nerved ; flower-buds rufous-tomentose 3. *Thonningii*

FIG. 128.—BAUHINIA THONNINGII *Schum.* (CAESALPINIACEAE).
A, under-surface of leaf. B, same, more highly magnified. C, longitudinal section of flower. D, fruit.

Leaves quite glabrous between the very close veins ; fruit linear, stipitate, straight or falcate, about 15–23 cm. long, 3·5 cm. broad, glabrous or slightly puberulous, with numerous nerves converging down the middle ; leaf-blades widely and shallowly cordate at the base, widely lobed for about ⅓ their length at the apex, 5–10 cm. long, up to 12 cm. broad, glaucous below ; flower-buds more or less greyish-pubescent .. .. **4.** *reticulata*

1. **Bauhinia rufescens** *Lam.*—F.T.A. 2 : 289 ; Holl. 2 : 264 ; Chev. Bot. 227. A much-branched shrub or a small tree up to 15 ft. high, with white flowers and black, often twisted, stalked, several-seeded pods.
Common all over the Sudan from the west to Abyssinia. Dahomey : Koundi. S. Nigeria : Abeokuta (Jan.) ! Exsicc.—*Heudelot. E. Vogel* 26. *Barter* 734. *Rowland. Talb.* 1227. *Chev.* 1182. *Oudney* 6. *Perrottet* 259. (See Appendix).
2. **B. tomentosa** *Linn.*—F.T.A. 2 : 290 ; Holl. 2 : 265 ; Chev. Bot. 228. A shrub with often pendulous branches and conspicuous yellow flowers.
Sierra Leone : Hill Station ! S. Nigeria : Degema ! Cultivated as an ornamental shrub ; wild in Central, East and South Tropical Africa, and in Asia. Exsicc.—*Holl.* 139. *Lane-Poole* 397. (See Appendix).
3. **B. Thonningii** *Schum.* Guin. Pl. 203. *B. reticulata* Oliv.—F.T.A. 2 : 290, partly, not of DC. ; Holl. 2 : 263 ; Chev. Bot. 227. A small tree, 15–20 ft. high, often of crooked growth and occasionally a scrambling shrub, rusty-tomentose on inflorescence, pods and under surface of the leaves ; petals white.
Common in open country and savannah forest throughout the area, and extending to the coastal districts in places ; all over tropical Africa, and into the Transvaal. Exsicc.—*Heudelot. Perrottet* 159 ; 258 ; 651. *Collenette* 62. *Barter* 981. *Irving* 62. *Sc. Elliot* 4658 ; 4766. *Johnson* 573. *Macgregor* 231. *Elliott* 4. *Dudgeon* 55. *Warnecke* 435. (See Appendix).
4. **B. reticulata** *DC.*—F.T.A. 2 : 291, in obs. (as to Vogel's specimen) ; Guill. & Perr. Tent. Fl. Seneg. 1 : 266, t. 60. *B. glabra* A. Chev. ; *B. glauca* A. Chev. Bot. 226. A small tree resembling the preceding.
Mauritania ! French Sudan : Gourma (July) ! Tacadji (Aug.) ! Djinjin (Aug.) ! Banangué (Sept.) ! Senegal : Cape Verde ! N. Nigeria : Bornu, Kuka (fr. Feb.) ! Duchi, Komadugu Waube (fl. and fr. Dec.) ! Katagum (Oct.) ! Extends to E. Sudan. Exsicc.—*Brunner* 114. *E. Vogel* 50. *Elliott* 144. *Farmar* 42. *Dalz.* 33. *Chev.* 2956 ; 2964 ; 2966 ; 3348 ; 24429 ; 24495. *Charles* in *Herb. Chev.* 28875. (See Appendix).
B. Adansoniana *Guill. & Perr.* = *B. divaricata* Linn., from the West Indies. (See Pellegrin in Bull. Soc. Bot. Fr. 1927 : 622).

3. OLIGOSTEMON Benth. (*Duparquetia* Baill.).—F.T.A. 2 : 267.

Shrub or small tree ; young parts rusty-pubescent ; leaves pinnate ; leaflets 3 pairs, opposite, ovate or elliptic to oblanceolate, abruptly acuminate, rounded at the base, 6–12 cm. long, 4–6 cm. broad, pubescent below, the terminal leaflet larger and more obovate ; racemes terminal, erect, many-flowered ; pedicels up to 2 cm. long ; sepals 4, the outer enclosing the others and about 2 cm. long, tomentellous ; petals 5, veiny, unequal ; stamens 4, the adaxial pair more or less connate ; anthers 1·3 cm. long, acuminate ; fruit 10 cm. long, dehiscent, with 4 ridges, glabrous .. .. *pictus*

O. pictus *Benth.*—F.T.A. 2 : 267 ; Chev. Bot. 221. *Duparquetia orchidacea* Baill. ; Stapf 598. A small tree 12–20 ft. high or a woody climber, with showy pink and white flowers.
Liberia : Kakatown ! Sino Basin ! Kada Town (Aug.) ! Ivory Coast : Cavally Basin, Grabo, etc. Gold Coast : common from Axim to Tarkwa (June, Sept.–Dec.) ! S. Nigeria : Calabar ! Cross R. (fl. and fr. Jan.) ! Oban ! Cameroons R. (Jan.) ! Also in French Cameroons. Exsicc.—*Mann* 751 ; 2210. *Whyte. Chipp* (no number). *Miles* 17. *Dalz.* 97. *Holl.* 249. *Williams* 22. *Talb.* 1210 ; 1709. *Linder* 364.

4. CYNOMETRA Linn.—F.T.A. 2 : 316.

Leaves 2- or more-foliolate :
Leaflets 6–10 pairs, more or less truncate or emarginate, oblong, up to 3 cm. long and 1·5 cm. broad :
Leaflets about 10 pairs, shortly pubescent on the midrib below ; flowers very small, in panicles shorter than the leaves ; pedicels 5–8 mm. long, shortly pubescent ; bracts ovate, long-acuminate, about 6 mm. long .. .. .. **1.** *Hankei*
Leaflets about 6 pairs, glabrous below, otherwise more or less as in the preceding **2.** *leonensis*

Leaflets 4–1 pairs :
Leaflets 3–4 pairs, acuminate :
Acumen very short and abrupt ; bracts shortly pubescent ; leaflets very obliquely oblanceolate, the uppermost pair the longest, up to 12 cm. long and 3·5 cm. broad, leathery, stiff, reticulate, nerves equally prominent on both sides ; inflorescence short and dense ; fruits about 4–6 cm. diam. .. .. **3.** *megalophylla*
Acumen rather long and gradual, deeply emarginate ; bracts glabrous and closely striate ; leaflets obliquely obovate-oblanceolate, the uppermost pair the largest, up to 6 cm. long and 2·5 cm. broad, glabrous ; inflorescence very short and densely bracteate ; pedicels rather densely pubescent ; fruits elliptic, about 4 cm. long, very rugose .. .. **4.** *Mannii*
Leaflets 1 pair (very rarely 2 pairs) :
Leaflets deeply emarginate, not acuminate, obovate-elliptic, up to 9 cm. long and 4 cm. broad, glabrous and shining ; flowers subfasciculate ; pedicels up to 1·5 cm. long, softly pubescent ; bracts small, strongly striate ; fruits shortly falcate, 3·5 cm. long, 2 cm. broad, wrinkled .. .. **5.** *Vogelii*
Leaflets acuminate, broadly sickle-shaped, 6–10 cm. long, 2–4 cm. broad, glabrous ; flowers small and rather crowded in short cymes ; pedicels very short, rusty-pubescent ; bracts small ; fruits broadly oblong, about 9 cm. long and 5 cm. broad, slightly nervose .. .. **6.** *ananta*

Leaves 1-foliolate ; leaflet very shortly petiolulate, elliptic, shortly acuminate, rounded at the base, 7–14 cm. long, 4–7 cm. broad, glabrous ; racemes very short and glomerule-like, few-flowered ; pedicels 1·5–3 mm. long ; sepals 4–5 mm. long, glabrous ; petals 5 .. .. 7. *leptoclada*

1. **Cynometra Hankei** *Harms* in Notizbl. Bot. Gart. Berlin, App. 21 : 39 (1911). A medium-sized tree with pubescent branchlets becoming glabrous ; the leaf-axis rather deeply channelled ; flowers white.
S. Nigeria : Oban ! Eket ! Also in French Cameroons. Exsicc.—*Talb.* 1639 ; 3279.
2. **C. leonensis** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A large tree near water ; flowers small, white.
Sierra Leone : Yandahun (Jan.) ! Bandama (Mar.) ! Kennema (Mar.) ! Exsicc.—*Unwin & Smythe* 52. *Aylmer* 136 ; 576.
3. **C. megalophylla** *Harms* in Engl. Bot. Jahrb. 26 : 262 ; Chev. Bot. 235. A large riverside and forest tree, the trunk sometimes divided near the base ; young foliage drooping, often wine-red ; flowers white ; pods with a single large very warted bean.
Sierra Leone. Ivory Coast : Bettié, on the Lower Comoé (fr. Mar.) ! Gold Coast : Anamabou ! Prah River (Dec., fr. Apr.) ! Odumasi ! Dixcove (fr. Apr.) ! Juafoabotang, E. Prov. ! Dahomey : Zagnanado, River Zou (Feb.) ! S. Nigeria : Lagos ! Ebute Metta (Dec.) ! Exsicc.—*Afzelius. Hove. Millen* 69. *Johnson* 926. *Chev.* 17259. (See Appendix).
4. **C. Mannii** *Oliv.*—F.T.A. 2 : 317 ; Holl. 2 : 278. A tree of river banks and fringing forest, up to 60 ft. high, the trunk sometimes short and divided near the base, occasionally prop-rooted ; young foliage red, leaflets notched at the tip like a claw-hammer ; flowers small, white.
S. Nigeria : Oban ! Calabar ! Ambas Bay (Jan.) ! Victoria (Mar.) ! Also in French Cameroons, Lower Congo and Gabon. Exsicc.—*Mann* 707. *Thomson* 1. *Talb.* 1708. *Kalbreyer* 83. (See Appendix).
5. **C. Vogelii** *Hook. f.*—F.T.A. 2 : 317 ; Chev. Bot. 235. A tree of spreading habit, sometimes attaining 60 ft. in height, or branching almost to the base.
French Sudan : San ; Djenné ; Ségou ; Sansanding. Senegal : ? locality ! Gambia ! French Guinea : Rio Nunez ! Sierra Leone : Scarcies R., Mofari (Jan.) ! Mano ! Ivory Coast : Indénié ; Soubré. N. Nigeria : Lokoja (Sept.) ! Nupe, on the banks of the Niger ! Abinsi, abundant on the Benue (Dec.) ! S. Nigeria : Abo ! Ilushi (Aug.) ! Exsicc.—*Heudelot* 340 ; 699. *T. Vogel* 105. *Ansell. Barter* 296 ; 901. (See Appendix).
6. **C. ananta** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A tall forest tree, the crown covered with light grey flowers ; often gregarious.
Gold Coast : Ankobra River Basin (Nov.) ! Dunkwa (fr. June) ! Exsicc.—*Chipp* 11. *Vigne* 875. (See Appendix).
7. **C. leptoclada** *Harms* in Engl. Bot. Jahrb. 53 : 459. A shrub or small tree with white flowers.
Fernando Po : Clarence Peak (Aug.) ! Exsicc.—*Mildbraed* 6346.

5. SCHOTIA Jacq.—F.T.A. 2 : 309.

A tree 25–30 ft. high ; branchlets often swollen and hollow under each node (occupied by ants) ; leaves paripinnate, 2–4 pairs, opposite, the lowest pair at the base of the petiole, obliquely oblong-elliptic, obtusely caudate-acuminate, unequal-sided at the base, 10–18 cm. long, 4·5–7 cm. broad, with about 8 pairs of prominently looped lateral nerves, glabrous ; racemes lateral, solitary or 2–3 together, very short, densely flowered ; pedicels 2–3 mm. long, bracteolate ; calyx-tube 7–8 mm. long, puberulous ; lobes 4, nearly as long as the tube, ovate-elliptic ; petals 5, subequal ; stamens 10, shortly coherent at the base ; filaments glabrous ; ovary and gynophore pilose ; ovules 4–5 .. .. *humboldtioides*

8. **humboldtioides** *Oliv.*—F.T.A. 2 : 310. Calyx green ; petals purple.
S. Nigeria : Oban ! Cameroons River (Jan.) ! Extends to Gabon. Exsicc.—*Mann* 726. *Talb.* 1440.

6. LOESENERA Harms in Engl. Bot. Jahrb. 26 : 268 (1899).

A tall shrub or tree up to 25 ft. high ; leaves simply paripinnate ; leaflets 3–4 pairs, opposite, the end pair the largest, the lowermost ovate-lanceolate, about 4–5 cm. long, the uppermost obliquely oblong-oblanceolate, 6–8 cm. long, obscurely nerved, glabrous ; racemes terminal ; flowers shortly stalked ; calyx-lobes 4, tomentose ; petals 5, 3 large (about 1·5 cm.) and 2 smaller ; stamens 10, free, filaments pilose at the base ; ovary stipitate, villous, the stalk more or less adnate to the calyx-tube ; ovules 2–3 ; fruits woody, broadly oblong, oblique at the base, acuminate, about 17 cm. long and 7 cm. broad, light-brown-tomentellous .. .. *kalantha*

L. **kalantha** *Harms* l.c. ; Stapf 600. Leaves pale-rusty below ; flowers pinkish ; fruits brown, very hard.
Liberia : Grand Bassa (Apr.–May) ! Du River (fr. July) ! Exsicc.—*Dinklage* 1634 ; 1805. *Linder* 129.

7. HYMENOSTEGIA Harms in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 1 : 193 (1897).

Leaflets about 8–10 pairs, oblong, acuminate, obtuse, 4–8 cm. long, 1·5–2·5 cm. broad ; rhachis shortly pubescent, 15–20 cm. long ; racemes very densely flowered, enclosed in bud by large closely striate leathery bracts ; bracteoles linear-oblanceolate, about 1 cm. long, pilose outside ; calyx-lobes large, obovate, coloured, veiny ; petals linear-oblanceolate ; stamens numerous .. .. 1. *Bakeriana*

Leaflets 2–4 pairs :

Tree or shrub ; leaflets 2 pairs, opposite, the lower pair smaller and more or less ovate-rhomboid, about 3 cm. long, the upper pair obliquely obovate, narrowed at both ends, obtusely acuminate, 7–10 cm. long, 2·5 cm. broad, glabrous ; rhachis winged, 1–3 cm. long ; racemes axillary, few-flowered, about as long as the leaves ; axis puberulous ; pedicels up to 1 cm. long ; bracteoles 2, large, petaloid and sub-membranous, 5 mm. long, inserted at the base of the calyx-tube ; petals 5, 3 larger, 2 much smaller ; stamens 10, free or nearly so .. .. .. 2. *Afzelii*

Tree ; leaflets 4 pairs, pairs subequal, obliquely oblong-oblanceolate, triangular-acuminate, 4–8 cm. long, 2–3·5 cm. broad, glabrous ; rhachis not winged, 5–10 cm. long ; racemes terminal, several-flowered, shorter than the leaves ; axis glabrous ; pedicels 2–2·5 cm. long, slender ; bracteoles oblong, about 1 cm. long, petaloid, inserted well below the base of the calyx-tube ; petals 3, unequal, much reduced ; stamens 10, free .. .. 3. *gracilipes*

1. **Hymenostegia Bakeriana** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Cynometra longituba* Bak. f. in Cat. Talb. Nig. Pl. 127, not of Harms. A tree with rather densely pubescent branchlets ; flowers red ? or drying reddish.
S. Nigeria : Oban ! Exsicc.—*Talb.* 1567.
2. **H. Afzelii** *Harms* l.c. ; Chev. Bot. 235. *Cynometra Afzelii* Oliv. —F.T.A. 2 : 318 ; Stapf 600. A tree attaining 60 ft. or more in the forest, with attractive flowers, white, lilac or pinkish, supported by bracteoles of the same colour.
French Guinea : Farana. Sierra Leone ! Liberia : Monrovia ! Ivory Coast : Indénié (Dec.) ! Sanvi ; Byanouan. Gold Coast : various localities ! Togo : Misahöhe (Nov.) ! S. Nigeria : Lagos Colony (Oct.) ! Ogba (Nov.) ! Oban ! Degema ! Extends to Angola. Exsicc.—*Afzelius. Thomas* 7655. *Johnson* 289 ; 615 ; 621 ; 922. *Moloney. Talb.* 210T ; 1309 ; 1720. (See Appendix).
3. **H. gracilipes** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. Riverside tree with white flowers.
Gold Coast : Sa, on the Bonsa R. (Aug.) ! Exsicc.—*Vigne* 978.

8. TAMARINDUS Linn.—F.T.A. 2 : 307.

A large tree ; leaves paripinnate ; leaflets 12–15 pairs, opposite, narrowly oblong, unequally rounded at the base, rounded or emarginate at the apex, 2–3 cm. long, 0·8–1 cm. broad, glabrous and rather strongly reticulate, often glaucous ; rhachis glabrous or pubescent ; flowers in small terminal glabrous racemes ; pedicels about 5 mm. long, jointed at the apex ; bracts nearly as long as the flower-bud, concave, deciduous ; sepals 4, 7 mm. long ; petals 3, 1 posterior, 2 lateral, slightly exceeding the calyx ; fertile stamens 3, alternating with small staminodes ; ovary stipitate ; fruit curved, oblong, about 10 cm. long, minutely scaly, inner part pulpy, intersected by fibres .. .. *indica*

T. indica *Linn.*—F.T.A. 2 : 308.
Common throughout the area in open country and savannah forest, cultivated and planted for shade, etc., elsewhere ; widely distributed in the tropics. (See Appendix).

9. CASSIA Linn.—F.T.A. 2 : 268.

Leaflets linear, numerous, 10 pairs or more ; leaf-rhachis with a sessile gland at the base ; flowers few, usually supra-axillary (the peduncle adnate to the stem) :
Leaflets very numerous and small ; flowers on fairly long pedicels (up to 2 cm. long) ; fruits many-seeded :
Leaflets short, up to 5 mm. long ; flowers small .. .. .. 1. *mimosoides*
Leaflets about 1 cm. long or more ; flowers over 1 cm. long .. .. 2. *Kirkii*
Leaflets up to 18 pairs, about 1·5 cm. long ; flowers subsessile ; fruits up to 11-seeded 3. *nigricans*
Leaflets never linear, at most lanceolate, usually less than 10 pairs ; flowers axillary or terminal :
Racemes terminal, elongated (not corymb-like), about 30 cm. long or more ; fruits indehiscent, elongated, cylindric, with numerous transverse 1-seeded partitions :
Leaflets ovate, gradually but obtusely acuminate, about 10 cm. long and 5 cm. broad, with numerous lateral nerves ; pedicels spreading, up to 4 cm. long ; bracts very early caducous ; ovary nearly glabrous .. .. 4. *Fistula*
Leaflets elliptic or oblong, very shortly cuneate at the base, shortly subacute or emarginate, 5–10 cm. long, 2·5–5 cm. broad, with several lateral nerves ; pedicels spreading, up to 5 cm. long ; bracts more or less persistent ; ovary tomentellous 5. *Sieberiana*
Racemes terminal or axillary, comparatively short (at least in flower) ; fruits usually dehiscent, rarely elongated and terete :
Leaflets acuminate or very acute :
Flowers in terminal bracteate corymbs, the lower pedicels the longest and elongated ; fruits as in *C. Sieberiana* but dehiscent longitudinally ; leaflets ovate-elliptic, cuneate at the base, 4–5 cm. long, 2–3 cm. broad, very prominently reticulate with numerous lateral nerves ; leaf-rhachis without glands ; lower pedicels up to 10 cm. long ; anthers subequal, elliptic, 5 mm. long .. .. 6. *Arereh*
Flowers not as above ; fruits mostly flattened, or if subturgid, then not very long (15 cm. or less) :
Axis of the leaves with a gland between each pair of leaflets ; leaflets 3–4 pairs, ovate-elliptic, the uppermost pair largest, very acute, 4–9 cm. long, 3–4 cm. broad, with a narrow cartilaginous margin, racemes shorter than the leaves, few-flowered ; anthers unequal, the longer curved ; fruits straight, subturgid, about 10 cm. long .. .. 7. *laevigata*
Axis of the leaves only with a gland near the base ; fruits linear :
Leaflets 5–9 pairs, the top pair not the largest, narrowly lanceolate, very acute, 4–7 cm. long, 1·5–2 cm. broad ; fruits subturgid, with prominent sutures, 7–8 cm. long, about 1 cm. broad, shortly beaked .. .. 8. *Sophera*

Leaflets 4–5 pairs, the top pair the largest, broadly lanceolate or ovate, 3·5–10 cm. long, 2–4 cm. broad ; fruits flattish, up to 14 cm. long and 1 cm. broad, abruptly beaked .. .. 9. *occidentalis*

Axis of the leaves without glands ; fruits oblong-elliptic, slightly curved, thin and flat, 4·5–6 cm. long, about 25 cm. broad, faintly marked with transverse nerves ; leaflets 4–6 pairs, lanceolate, 2·5–3 cm. long, very shortly pubescent, glaucous 10. *acutifolia*

Leaflets rounded or at most subacute or mucronate at the apex :

Leaflets 4 pairs or more :

Leaflets small (about 2·5–4 cm. long), oblong or obovate :

Fruits curved, flat, broadly oblong, with an undulate crest up the middle ; rhachis of leaves with no glands or very obscure ; flowers in single racemes 11. *obovata*

Fruits subturgid, long, not crested ; rhachis of leaves with a slender club-shaped gland between each pair of leaflets ; flowers in corymbose clustered racemes ; bracts club-shaped and glandular .. .. 12. *goratensis*

Leaflets larger (over 5 cm. long), more or less elliptic or oblong ; fruits straight and elongated :

Leaflets 4–5 pairs, more or less narrowed at each end, elliptic, 6–12 cm. long,

FIG. 129.—CASSIA SIEBERIANA *DC.* (CAESALPINIACEAE).

A, B, two types of stamen. C, longitudinal section of pistil. D, mature fruit. E, seed. F, cross section of seed.

3·5–6 cm. broad ; rhachis not winged ; pods straight, 10–12 cm. long, 1·5 cm. broad, flat, with transverse ridges .. ..13. *podocarpa*

Leaflets 8–12 pairs, rounded or subtruncate at each end, 5–15 cm. long, 3–8 cm. broad, rhachis narrowly winged, with a transverse ridge connecting the leaflets ; pods straight, about 15 cm. long, each valve with a prominent broad crenate wing along the middle .. .. 14. *alata*

Leaflets 2–3 pairs :

Stems not viscid-glandular ; leaflets 3 pairs, obovate, mucronate, up to 6 cm. long and 3 cm. broad, ciliate on the margin ; inflorescence 2-flowered ; fruits usually paired, curved and slender, up to 20 cm. long, subterete .. .. 15. *Tora*

Stems viscid-glandular, pubescent ; leaflets 2 pairs, obliquely obovate, pubescent, 2–6 cm. long, 1·5–3 cm. broad ; inflorescence several-flowered, racemose ; fruits flat, linear, up to 5 cm. long and 1 cm. broad, bristly .. .. 16. *Absus*

In addition to the above, *Dalziel* (No. 8297) has collected in a bamboo forest, near Dunkwa village, Central Province, Gold Coast, a specimen of *Cassia bacillaris* Linn. f., a native of tropical America, and occasionally recorded from tropical Asia ; a tree ; leaflets large, 2 pairs, broadly ovate-elliptic, acuminate ; flowers large, long-pedicellate in corymbs.

1 **Cassia mimosoides** *Linn.*—F.T.A. 2 : 280 ; Stapf 599 ; Holl. 2 : 258 ; Chev. Bot. 222. Annual herb or a half-woody undershrub, erect or diffuse, with yellow flowers.

Common on sandy soil throughout the area, and elsewhere in tropical Africa, Asia and Australia. (See Appendix).

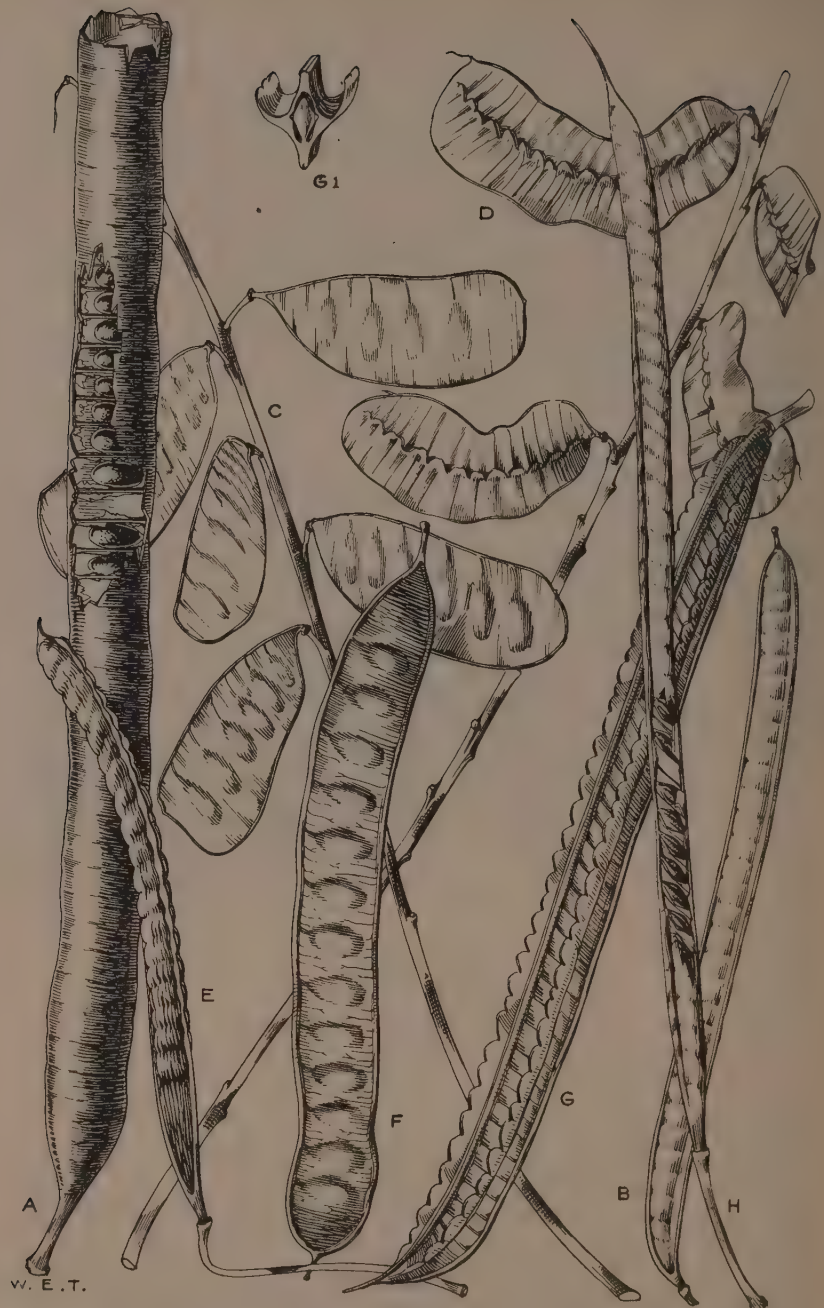

FIG. 130.—FRUITS OF CASSIA (CAESALPINIACEAE).

A, CASSIA SIEBERIANA *DC.* B, C. OCCIDENTALIS *Linn.* C, C. ACUTIFOLIA *Delile.* D, C. OBOVATA *Collad.* E, C. GORATENSIS *Fresen.* F, C. PODOCARPA *Guill. & Perr.* G, C. ALATA *Linn.* G1, section of C. ALATA *Linn.* H, C. TORA *Linn.*

2. **C. Kirkii** *Oliv.*—F.T.A. 2 : 281. Resembling the last (of which it may be only a luxuriant form) but more robust and more hirsute, with larger leaflets, flowers and pods.
Liberia ; near Bakratown ! Gold Coast : locality ? N. Nigeria : Bauchi Plateau ; Naraguta (Aug.) ! Vom ! Extends through the Congo to Angola and the Zambesi. S. Nigeria : Eket ! Exsicc.—*Lely* 538. *Dent Young* 86, partly. *Miles. Talb. Linder* 876.
3. **C. nigricans** *Vahl*—F.T.A. 2 : 280 ; Chev. Bot. 223. A woody herb or undershrub up to 4 or 5 ft. high, with small yellow flowers.
French Sudan : Bilma (Dec.) ! Toukoto (Dec.) ! Ouacoro ; Bobo-Dioulasso ; San. Senegal : ? locality ! Gambia ! Dahomey : Atacora Mts. 1,000–1,800 ft. N. Nigeria : Lokoja, Mt. Patti ! Kontagora (Oct.) ! Kano ! Sokoto ! Nabardo (Sept.) ! Kuka (Jan.) ! Extends to Abyssinia, Nile Land, East Africa, Arabia and India ; also in Angola. Exsicc.—*Heudelot* 256. *E. Vogel* 21. *Barter* 534.
4. **C. Fistula** *Linn.*—F.T.A. 2 : 270, in obs. ; Holl. 2 : 257. A glabrous tree, 50 ft. high, with long pendulous racemes of yellow flowers ; leaves 1 ft. or more long, with 4–5 pairs of leaflets and long pipe-like pods which do not split.
Gold Coast : Aburi and Akwapim (an Indian species, introduced) ! Exsicc.—*Johnson* 1106. *Gould.*
5. **C. Sieberiana.** *DC.*—F.T.A. 2 : 270 ; Holl. 2 : 260 ; Chev. Bot. 224. *C. Kotschyana* Oliv. *C. Sieberiana* var. *saheliensis* A. Chev. A small tree up to 30 ft. high, like the preceding, with laburnum-like yellow flower-racemes and cylindrical pods 1 to 3 ft. long and ¾ in. broad ; flowering usually in the dry months.
Common throughout the area in open country and savannah forest ; extending to E. Sudan, Uganda and E. Africa. Exsicc.—*Sieber. Heudelot* 348. *Don. E. Vogel* 72. *Barter* 3361. *Mann* 799. *Sc. Elliot* 4645a ; 5071. *Rowland. Ozanne* 33. *Elliott* 47. *Farmar* 256. *Evans* 1105. *McLeod* 829. *Talb.* (no number). *Pobéguin* 123. *Schlechter* 12342. *Chev.* 24518. (See Appendix).
6. **C. Areereh** *Delile*—F.T.A. 2 : 270. A small tree with corymbose yellow flowers and brown cylindrical pods 1–2 ft. long, splitting lengthwise.
N. Nigeria : Sokoto (Feb.) ! Zaria Province (Mar., Apr.) ! Yola (Mar.) ! Extends to Abyssinia and the Red Sea. Exsicc.—*Dalz.* 8. *Ryan* 9 ; 39. *Lely* 847. (See Appendix).
7. **C. laevigata** *Willd.*—F.T.A. 2 : 275. A glabrous shrub, 6–10 ft. high, with smooth green branchlets and fairly large yellow flowers.
Sierra Leone : Freetown (fr. June) ! Fernando Po (fr. Nov.) ! Exsicc.—*T. Vogel* 126 ; 200. *Mann* 1168. A tropical American species, introduced.
8. **C. Sophera** *Linn.*—F.T.A. 2 : 274 ; Holl. 2 : 260 ; Chev. Bot. 225. A weak shrub, 3–5 ft. high, with yellow flowers in short racemes or fascicles.
Sierra Leone : Waterloo (June) ! Ivory Coast : Middle Comoé, between Ebrinahoué and Diangobo (fl. and fr. Dec.) ! Gold Coast : Cape Coast (July) ! Tarkwa (Jan.) ! Dahomey : Zagnanado ; Abomey. N. Nigeria : Bassa (Oct.) ! S. Nigeria : Lagos Colony ! Fernando Po (fr. Nov., Dec.) ! A native of India ; in West Africa found in villages and cultivated clearings ; easily confused with the next species. Exsicc.—*T. Vogel* 24 ; 211. *Mann* 69. *Chipp* 61. *Lane-Poole* 304. *Punch* 74. *Lamb* 86.
9. **C. occidentalis** *Linn.*—F.T.A. 2 : 274 ; Stapf 599 ; Holl. 2 : 259 ; Chev. Bot. 224. A glabrous herb or undershrub, woody below, annual or of 2–3 years' duration, much like the preceding.
A common tropical plant, chiefly found near villages. (See Appendix).
10. **C. acutifolia** *Delile*—F.T.A. 2 : 278 ; Holl. 2 : 256. A glabrous undershrub with pale more or less zigzag branchlets, and erect racemes of yellow flowers. Alexandrian senna.
French Sudan : Air (Nov.) ! Timbuktu and Sokoto (*vide* Batka—Monogr. Senna : 41, 1866). Common in Upper Egypt, Eastern Sudan, Nile Land and Somaliland. Exsicc.—*Francis Rodd.* (See Appendix).
11. **C. obovata** *Collad.*—F.T.A. 2 : 277 ; Holl. 2 : 258 ; Chev. Bot. 223. Undershrub, often with herbaceous branches from a woody stock, more or less glaucous.
From Mauritania and Senegal throughout the Sudan to N.W. India ; also in Angola to S.W. and S. Africa. Exsicc.—*Perrottet. E. Vogel* 13. *Barter* 3442. (See Appendix).
12. **C. goratensis** *Fresen.*—F.T.A. 2 : 273 ; Chev. Bot. 222. A shrub or small tree up to 30 ft. high, with copious yellow flowers, and pods 3–4 in. long, subcylindrical, beaked, constricted between the seeds.
French Sudan : Negala (Jan.) ! Gourma (July) ! Kati. N. Nigeria : Kontagora (Jan.) ! Maigana (Dec.) ! Katagum (Dec.) ! Bauchi Plateau, Vodni, 4,600 ft. (July) ! Vom ! Lake Chad (fr. May) ! Yola (Oct.). Maska (Feb.) ! Extends to Abyssinia, E. Sudan and E. Africa, Angola, S.W. Africa and Rhodesia. Exsicc.—*F. Vogel* 96. *Dalz.* 3 : 29. *Talb.* 512. (See Appendix).
13. **C. podocarpa** *Guill. & Perr.*—F.T.A. 2 : 276 ; Stapf 599 ; Chev. Bot. 224. A glabrous shrub up to 15 ft. high, with rather dense racemes of yellow flowers and thin flat pods.
Senegal : Tiaraye ; Casamance, Floup-Fedyan ; Tambana. Sierra Leone : Regent (fr. Dec.) ! Commendi (Nov.) ! Sherboro ! Liberia : Kakatown ! St. Paul's River ! Peahtah (Oct.) ! Gold Coast : Aburi (fr. Oct.) ! Afram Plains ! S. Nigeria : Lagos ! Oloke Meji ! Lagos Colony ! Agolo ! Ibuzo (Nov.) ! Fernando Po (fl. and fr. Dec.) ! Exsicc.—*Barter* 2203. *Mann* 638. *Sc. Elliot* 4098 ; 5854. *Whyte. Reynolds. Johnson* 466 ; 1098. *Foster* 152. *Linder* 941. (See Appendix).
14. **C. alata** *Linn.*—F.T.A. 2 : 275 ; Holl. 2 : 257 ; Chev. Bot. 222. A soft-wooded shrub, up to 15 or more feet high, with yellow flowers in stout dense erect racemes.
In villages and clearings chiefly in the forest regions ; a native of America, widely spread in the tropics. Exsicc.—*Barter* 3348. *Sc. Elliot* 4006. *Cummins* 6. *Talb.* 184. (See Appendix).
15. **C. Tora** *Linn.*—F.T.A. 2 : 275 ; Stapf 599 ; Holl. 2 : 260 ; Chev. Bot. 225. An undershrub, 3–6 ft. high, with yellow flowers in pairs or singly.
Widely spread in tropical Africa and in other warm lands. (See Appendix).
16. **C. Absus** *Linn.*—F.T.A. 2 : 279 ; Holl. 2 : 256 ; Chev. Bot. 221. A viscid herb or weak undershrub, 1–2 ft. or more high, erect or prostrate ; sometimes purple-tinged ; flowers small, red, sometimes yellow ; petals dark-veined.
French Sudan : Koulikoro ; Mossi. Senegal : ? locality ! Casamance, Ziguinchor. French Guinea : Kouria ; Ymbo. Sierra Leone : Scarcies R. (Dec.) ! Kaballa ! Jigaya ! Bumban ! Ivory Coast : Bingerville, Potou Lagoon. Gold Coast : Accra ! Dahomey : Cotonou (Apr.) ! N. Nigeria : Nupe ! Sokoto (Dec.) ! Katagum (Sept.) ! Alkalire (Sept.) ! S. Nigeria : Idah (Sept.) ! Extends to E. Sudan, Abyssinia, E. and S.W. Africa to S. Africa ; also in Asia and Australia. Exsicc.—*Perrottet* 414. *T. Vogel* 13. *Barter* 1626. *Sc. Elliot* 4315. *Brown* 57. *Debeaux* 147. (See Appendix).

10. BAIKIEA Benth.—F.T.A. 2 : 309.

Leaflets 2–5, alternate or subopposite, obliquely oblong-elliptic, gradually acuminate and rather blunt, base rounded and umbonately thickened on one side, 12–30 cm. long, 4·5–8 cm. broad, entire, leathery, glabrous, with indistinct nerves ; petiolules 1 cm. long, transversely wrinkled ; stipules small, scale-like ; flowers few, nodding, clustered at the tips of the twigs, densely velvety in bud ; pedicels stout, 2 cm. long, velvety ; calyx-tube turbinate ; lobes broadly linear, up to 11 cm. long, velvety outside, at length recurved ; petals up to 20 cm. long, obovate, hairy down the middle, the upper petal yellow inside, the others white, veiny ; stamens 10, upper one free, the others unequally connate and pubescent below ; anthers 1·3 cm. long ;

ovary long-stipitate, densely villous ; fruit flat, curved, large, wrinkled and finely velvety .. .. *insignis*

B. insignis *Benth.*—F.T.A. 2 : 309 ; Bot. Mag. t. 8819 ; Holl. 2 : 276. A tree up to 60 ft. high, with very large flowers.
S. Nigeria : Lagos Colony ! Oban ! Fernando Po (Mar.) ! Extends to Congo and Uganda. Exsicc.—*Mann* 2342. *Moloney*. *Punch* (no number). *Talb.* 1749. (See Appendix).

11. TESSMANNIA Harms in Engl. Bot. Jahrb. 45 : 295 (1910).

Leaflets about 6, alternate, obliquely obovate-oblanceolate, obtusely acuminate, cuneate at the base, 5–7 cm. long, 2–3 cm. broad, glabrous except the puberulous midrib below, with numerous lateral nerves, petiolules very short; flowers few, about 1·5 cm. long in bud ; pedicels up to 2 cm. long, tomentellous ; sepals oblong-lanceolate, acute, appressed-tomentellous ; petals seen only in the bud stage, but with a very hairy midrib ; ovary densely villous ; style spirally coiled in bud *baikieaoides*

T. baikieaoides *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. Medium-sized tree in rain-forest.
Sierra Leone : York Pass (Dec.) ! Exsicc.—*Aylmer in Herb. Lane-Poole* 137.

12. DISTEMONANTHUS Benth.—F.T.A. 2 : 282.

A large tree ; leaves pinnate ; leaflets 9–11, alternate, ovate-lanceolate to narrowly lanceolate, acutely acuminate, rounded at the base, 5–10 cm. long, 2–4 cm. broad, slightly pubescent below, with numerous conspicuous lateral nerves ; flowers in lax paniculate cymes ; bracts small and deciduous ; pedicels pubescent ; sepals 5, the outer 3 valvate, about 1 cm. long ; petals 3, narrow, a little longer than the calyx ; fertile stamens 2, anthers opening by pores ; ovary tomentose ; fruit narrowly elliptic, acute, flat, about 9 cm. long and 3·5 cm. broad, at length glabrous *Benthamianus*

D. Benthamianus *Baill.* Hist. des Pl. 2 : 135 ; Engl. Pflanzenw. Afr. 3, 1 : 492, fig. 263. *D. laxus* Oliv.—F.T.A. 2 : 282. A tree 100 or more ft. high ; branchlets often with red bark.
Gold Coast : Dunkwa (May, fr. July, Aug.) ! Togo : Atakpame. S. Nigeria : Benin (Jan.) ! Eket ! Oban ! Johann-Albrechtshöhe. Also in French Cameroons, Spanish Guinea and Gabon. Exsicc.—*Chipp* 714. *Brent* 885. *Vigne* 907. *Dennett* 50. *Talb.* 1497 ; 3045. *Staudt* 638 ; 926. (See Appendix).

13. OXYSTIGMA Harms in Engl. & Prantl, Nat. Pflanzenf. Nachtrag 1 : 195 (1897)

A tree up to 120 ft. high ; leaflets 1 pair or occasionally 3–4 leaflets, oblong, rounded at both ends, 7–15 cm. long, 3–5 cm. broad, rigidly leathery, glabrous, with about 10 pairs of rather obscure lateral nerves ; rhachis up to 3 cm. long ; panicles axillary, often resembling clusters of racemes up to 15 cm. long ; flowers very small, globose in bud ; pedicels about 1·5 mm. long ; bracts and bracteoles very small ; calyx-lobes thin, rounded, glabrous ; petals absent ; stamens 10 ; ovary sessile, pilose 1. *Mannii*

A large tree ; leaflets 3–4 pairs, the lowest pair elliptic, smaller, the uppermost pair broadly oblanceolate, 12–20 cm. long, 4–7 cm. broad, reticulate, with about 8 pairs of lateral nerves ; spikes densely crowded, 6–10 cm. long ; petals 5, conspicuous in bud ; stamens 10, unequal ; ovary shortly stipitate .. .. .. 2. *Stapfiana*

1. **O. Mannii** *Harms* l.c. and in Engl. Bot. Jahrb. 26 : 264. *Hardwickia* (?) *Mannii* Oliv.—F.T.A. 2 : 316. *Eriander Engleri* H. Winkl. A forest tree with glabrous branchlets and spike-like racemes of white or pinkish flowers.
S. Nigeria : Calabar River (Mar.) ! Cameroons River (Jan.) ! Victoria ! Also in Spanish Guinea. Exsicc. —*Mann* 754 ; 2194. *Holl.* 92. *Winkler* 669. (See Appendix).

2. **O. Stapfiana** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8d : 166 ; Chev. Bot. 234. A tree over 100 ft. high, with bole reaching 60 ft., with leaves crowded at the ends of the branchlets.
Ivory Coast : Cavally Basin, Fort Binger, in the forest (July) ! Grabo, basaltic hills of Mt. Tou, 1,000 ft. (July) ! Exsicc.—*Chev.* 19528. This species scarcely conforms to the generic description, having 5 equal petals. We have been unable, however, to place it in any other genus.

14. DIALIUM Linn.—F.T.A. 2 : 282.

Leaflets about 5, fairly large, elliptic to lanceolate, 5–12 cm. long, 2–5 cm. broad, leathery, sometimes finely pustulate or shortly and minutely pubescent below ; panicles diffuse, with long primary branches ; flower-buds ovoid, about 4 mm. long ; ovary shortly stipitate ; fruit suborbicular, slightly flattened, 2–2·5 cm. diam., densely black- or brown-velvety-tomentellous ; seeds hard and shining, embedded in pulp .. .. 1. *guineense*

Leaflets numerous, small, narrowly oblong :

Leaflets acute at the apex, 2·5–5 cm. long ; branches of inflorescence rather elongated, spreading, with short lateral cymules ; ovary and fruit not stipitate, the latter similar to above .. .. 2. *Dinklagei*

Leaflets very obtuse or rounded at the apex ; other characters much as in the above but panicles less diffuse .. .. 3. *Staudtii*

1. **Dialium guineense** *Willd.*—F.T.A. 2 : 283 ; Holl. 2 : 261 ; Chev. Bot. 226. *D. nitidum* Guill. & Perr. Tent. Fl. Seneg. 1 : 267, t. 58. A tree of mixed deciduous and savannah forests, reaching 50–60 ft. with 8 ft. girth on Bauchi Plateau ; branchlets rusty-puberulous ; flowers small in copious brownish flat panicles ; petals white or pinkish.

Common locally from Senegal to French Cameroons ; also in Princes Island and Ubangi-Shari. Exsicc.—*Heudelot* 32 ; 584. *Perrottet* 299. *Döllinger* 39. *Don* 42. *T. Vogel* 108. *Ansell. Barter* 1795. *Irving* 77. *Sc. Elliot* 4178. *Linder* 214. *Johnson* 808. *Brown* 371. *Farmar* 295 ; 295a. *Pobéguin* 584. *Mildbr.* 7474 ; 7494. *Warnecke* 211. *Hunter* 44 ; 56. (See Appendix).

2. **D. Dinklagei** *Harms* in Engl. Bot. Jahrb. 26 : 275 ; Stapf 599 ; Chev. Bot. 225. A small to medium-sized tree with spreading crown and buttressed stem ; inflorescence like the last but flowers without petals.
French Guinea : Kissidougou (fr. Feb.) ! Liberia : Grand Bassa ! Du River (July) ! Ivory Coast : Dabou (Feb.) ! Gold Coast : Aburi (Aug.) ! Dunkwa (Aug.) ! Exsicc.—*Dinklage* 1813. *Johnson* 1087. *Vigne* 972. *Linder* 68.

3. **D. Staudtii** *Harms* l.c. Habit of the above.
S. Nigeria : Johann-Albrechtshöhe (Dec.) ! Also in French Cameroons. Exsicc.—*Staudt* 492.

15. HYLODENDRON Taub. in Engl. & Prantl, Nat. Pflanzenf. 3, 3 : 386 (1894).

Tree up to 100 ft. high ; branchlets glabrous ; leaves pinnate ; leaflets alternate, about 7 pairs, oblong, acuminate, rounded or obtuse at the base, 10–12 cm. long, 3–5 cm. broad, with numerous lateral nerves on each side of the midrib prominent on both surfaces ; stipules very long, leathery, linear, 5–6 cm. long, closely longitudinally striate, glabrous ; flowers small, in short lateral racemes, covered in bud by leathery, closely imbricate, striate, broadly ovate bracts, minutely ciliate on the margin ; fruits narrowly oblong, slightly curved, flat, 10–12 cm. long, 2–3 cm. broad, laxly reticulate, 1–2-seeded, glabrous .. .. *gabunense*

H. gabunense *Taub.* l.c.
S. Nigeria : Victoria, in forest ! Johann-Albrechtshöhe ! Also in French Cameroons and Gabon. Exsicc. —*Winkler* 1164. *Staudt* 939. (See Appendix).

16. CRUDIA Schreb.—F.T.A. 2 : 312.

Stipules intrapetiolar, connate for nearly ½ their length on their inner side, obliquely lanceolate, about 2 cm. long, nervose, glabrous ; leaves simply imparipinnate ; leaflets alternate, with twisted petiolules, slightly falcate, oblong, obtusely acuminate, 5–8·5 cm. long, 2–3·5 cm. broad, with numerous reticulate lateral nerves, glabrous ; racemes slender, pendulous, about 18 cm. long ; pedicels slender, 1·5 cm. long, with 2 small bracteoles towards the base ; sepals obovate, 5 mm. long ; ovary shortly stipitate, densely woolly .. .. 1. *senegalensis*

Stipules intrapetiolar, free, ovate-lanceolate, up to 3 cm. long, strongly nerved, glabrous ; leaves as above but rather larger and broadly elliptic ; pedicels about 2 cm. long, without bracteoles ; flowers as above ; fruits broadly oblong, 15–18 cm. long, 5–6 cm. broad, transversely nerved, glabrous ; seeds suborbicular, flat, blackish, 4 cm. diam. 2. *Klainei*

1. **C. senegalensis** *Planch.* ex *Benth.*, partly.—F.T.A. 2 : 312, partly ; Chev. Bot. 233. A glabrous shrub or small tree.
Senegal ! French Guinea : Rio Nunez ! Sierra Leone ! Ivory Coast : Bingerville ! Lower Cavally, between Prolo and Blieron ! Dahomey : Porto Novo Lagoon ! Exsicc.—*Heudelot* 708. *Afzelius. Cher.* 17346 ; 19890 ; 19894 ; 22797.

2. **C. Klainei** *Pierre* ex *De Wild.* in Bull. Jard. Bot. Brux. 7 : 250. *C. senegalensis* Oliv. in Hook. Ic. Pl. t. 2378, not of Planch. A glabrous tree like the last, growing by rivers.
S. Nigeria : Nun River (Sept.) ! Lagos ! Epe ! Eket ! Victoria (fr. Feb.) ! Fernando Po (Dec.) ! Also in French Cameroons and Gabon. Exsicc.—*Barter* 3270. *Mann* 14 ; 500. *Millen* 130. *Talb.* 3240. *Punch* 110. *Dalz.* 8246. (See Appendix).

17. TALBOTIELLA Bak. f. in Journ. Bot. 1914 : 2, t. 529.

A shrub up to 20 ft. high ; leaves paripinnate ; leaflets about 15–20 pairs, opposite, 1·3–1·5 cm. long, auriculate on the lower side, obtuse at the apex, glabrous ; racemes axillary and terminal, slender, softly pilose ; pedicels 1·5 cm. long, very slender, pilose ; flowers about 5 mm. long ; bracteoles linear ; sepals glabrous, elliptic ; stamens 8–10, free ; ovary stipitate, villous .. .. 1. *eketensis*

A tree ; leaves paripinnate ; leaflets about 6 pairs, opposite, about 2 cm. long and 1 cm. broad, auriculate on the lower side, rounded at the apex, glabrous ; racemes axillary, about 3 cm. long, pilose, with thick leathery perulae at the base ; pedicels 1 cm. long, pubescent ; sepals glabrous ; stamens 8–9 ; ovary stipitate, villous 2. *Gentii*

1. **T. eketensis** *Bak. f.* l.c. A bushy shrub with dark glossy leaves when mature, white flowers with orange stamens and pink bracteoles.
S. Nigeria : Ibeno, at the estuary of the Kwa Ibo River ! Degema ! Exsicc.—*Talb.* 3188 ; 3625.

2. **T. Gentii** *Hutch. & Greenway* in Kew Bull. 1928, ined. A heavy-foliaged tree.
Gold Coast : North Scarp, Kwahu (Dec.) ! Exsicc.—*Gent* 184.

18. GOSSWEILERODENDRON Harms in Notizbl. Berl. Bot. Gart. 9 : 457 (1925).

A large tree ; branchlets glabrous ; leaves pinnate ; leaflets alternate, with an end one, oblong-elliptic, obtuse or obtusely pointed, 4–9 cm. long, 2–4 cm. broad, densely pellucid-glandular, otherwise glabrous ; racemes spiciform, simple or branched, up to 10 cm. long ; axis slightly pubescent ; calyx slightly pubescent ; petals absent ; stamens 8–10, free, filaments hairy at the base ; ovary stipitate, villous ; ovule

solitary, pendulous ; fruit 1-seeded, with a broad basal oblique wing about 8 cm. long and 3·5 cm. broad, the fruit body ellipsoid, about 2·5 cm. long .. *balsamiferum*

G. balsamiferum *Harms* l.c. fig. 9, F–L. *Pterygopodium balsamiferum* Vermoesen. A very large evergreen forest tree with cylindrical bole and light foliage ; flowers in whitish spikes, the sepals pellucid-dotted ; fruit samara-like with the seed at the distal end.
S. Nigeria : Benin (fr. June) ! Sapoba, near Sapele (fr. Apr.) ! Ondo ; Warri ; Owerri. Also in Belgian and Portuguese Congo. Exsicc.—*St. Barbe Baker.* (See Appendix).

19. DETARIUM Juss.—F.T.A. 2 : 312.

A tree ; leaves simply pinnate ; leaflets 6–12, alternate, oblong-elliptic, rounded at both ends, more or less emarginate at the apex, 5–8 cm. long, 2·5–4·5 cm. broad, leathery, rather glaucous below with numerous parallel lateral nerves, minutely pubescent below ; flowers small, in small axillary panicles shorter than the leaves ; buds subglobose, about 4 mm. long, glabrous or nearly so ; sepals pubescent inside, subvalvate ; petals 0 ; stamens 10, free ; ovary densely villous, with 2 ovules ; fruit suborbicular, rather flattened, about 7 cm. diam., covered with an outer smooth crustaceous skin and an intermediate layer of very fibrous tissue, woody inside ; seed flattened .. .. 1. *senegalense*

D. senegalense *Gmelin*—F.T.A. 2 : 313 ; Holl. 2 : 277 ; Chev. Bot. 234 (incl. *D. Heudelotianum* Baill. and *D. microcarpum* Guill. & Perr.) ; Guill. & Perr. Tent. Fl. Seneg. 1 : 269, t. 59 ; Engl. Pflanzenw. Afr. 3, 1 : 447, fig. 245. In the forest a timber tree attaining a bole of 40 ft. and 12 ft. girth, with more or less gland-punctate leaves, creamy fragrant flower panicles and round succulent fruit like a flattened mango ; in the open savannah a stunted tree with much smaller less succulent fruit and forming often small abortive or galled fruits.
Throughout the area ; also in French Cameroons and extending to Ubangi-Shari and Upper Congo Basin. Exsicc.—*Perrottet. Heudelot* 571 ; 822. *Barter* 1073. *Brown-Lester* 1. *Sc. Elliot* 5333 ; 5348 ; 5701. *Elliott* 84 ; 206. *Pobéguin* 427 ; 689. *Chev.* 12992. *Kersting* A 538. (See Appendix).

20. COPAIFERA Linn.—F.T.A. 2 : 313.

Leaflets about 6–7 pairs, oblong, deeply emarginate at the apex, rounded at the base, 3–3·5 cm. long, 1·5 cm. broad, shining, with numerous slender lateral nerves conspicuous on both surfaces, with a thick margin, glabrous ; panicles simply branched, a little longer than the leaves ; rhachis puberulous ; flowers sessile, very small ; bracts ovate, pubescent ; sepals obovate, 3–4 mm. long ; seeds oblong, 3 cm. long, covered by a waxy red aril .. .. 1. *Salikounda*

Leaflets 1 pair :

Leaflets boat-shaped with one side nearly straight, obtusely acuminate, 5–12 cm. long, 2·5–4·5 cm. broad, with 3–4 prominent longitudinal nerves from the base, glabrous ; petiole very short ; stipules oblong-lanceolate, obtuse, leafy, 6–7 mm. long ; flowers in numerous panicled spikes longer than the leaves ; bracts ovate, caducous ; bracteoles closely investing the calyx ; sepals glabrous ; fruits flat, broadly obliquely elliptic, about 4 cm. long, with a nerve parallel to the margin on one side, glandular-pustulate .. .. 2. *Guibourtiana*

Leaflets boat-shaped, shortly acuminate, 8–12 cm. long, 4–5 cm. broad, more or less pinnately nerved from the base, glabrous ; petiole 1·5 cm. long ; stipules deciduous ; spikes shorter than the leaves ; flowers not seen ; fruits flat, suborbicular, about 2·5 cm. diam., not marginally nerved, glabrous .. .. .. 3. *Demeusii*

Leaflet solitary, ovate-rounded, long-acuminate, 7–10 cm. long, 4–7 cm. broad, glabrous, with 3 strong longitudinal nerves from above the base and with a pair of weaker ones on each side at the base ; flowers in terminal panicles of spikes, sessile, very small ; bracts minute ; sepals 4, glabrous, rugose .. .. 4. *Dinklagei*

1. **Copaifera Salikounda** *Heck.* in Ann. Fac. Sci. Marseille 3, fasc. 4, t. 16. *Detarium Chevalieri* Harms. A large tree, often more or less gregarious, 30–45 ft. high, with rugose bark ; pods brown, woody, flat, oval, 1¼ in. long, ¾ in. broad, 1-seeded.
French Guinea (not seen). Sierra Leone : Sherboro ! Ivory Coast : Bingerville (Feb.) ! Gold Coast : ? locality ! Exsicc.—*Evans* 15. *Poisson. Chev.* (no number). (See Appendix).
2. **C. Guibourtiana** *Benth.*—F.T.A. 2 : 314 ; Holl. 2 : 277 ; Chev. Bot. 234. *C. Ehie* A. Chev., *C. Vuilletii* A. Chev., names only. A tree.
French Sudan : Koulikoro ! French Guinea : Kindia ; Dubréka. Sierra Leone : Kenema ! R. Scarcies ! Lumley ; York ; Ronietta ; Karene ; Kassewe Hills. Ivory Coast : Morénou (Nov.) ! S. Nigeria : ? locality ! Exsicc.—*Daniell. Sc. Elliot* 4537. *Unwin & Smythe* 5. *Farquhar* 53. *Chev.* 22447. *Burns.* (See Appendix).
3. **C. Demeusii** *Harms* in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 1 : 195.
S. Nigeria : Calabar ! Extends to Ubangi and the Congo. Exsicc.—*Milne.*
4. **C. Dinklagei** *Harms* in Engl. Bot. Jahrb. 26 : 265 ; Stapf 600. A glabrous shrub or small tree.
Liberia : banks of Biso R., near Grand Bassa ! Exsicc.—*Dinklage* 1695.

21. POLYSTEMONANTHUS Harms in Engl. & Prantl, Nat. Pflanzenf. 3, 3 : Nachtr. 197, and in Engl. Bot. Jahrb. 26 : 273, t. vii.

Tree with rusty-tomentellous branchlets and inflorescence ; leaves simply paripinnate ; leaflets about 6 pairs, opposite, oblong, abruptly acuminate, rounded at the base, 5–12 cm. long, 2·5–5 cm. broad, glabrous above, finely rusty-puberulous below ; lateral nerves 10–12 pairs, prominent below ; panicles terminal ; bracteoles large, persistent for a long time, enclosing the flower-bud, valvate, 2–2·5 cm. long, with a

FIG. 131.—FRUITS OF CAESALPINIACEAE.

A, COPAIFERA GUIBOURTIANA *Benth.* B, DANIELLIA OLIVERI *Hutch. & J. M. Dalz.* C, BERLINIA HEUDELOTIANA *Baill.* D, MACROLOBIUM LIMBA *Scott Elliot.*

gland-like horn at the apex ; sepals 4, imbricate, silky-villous outside ; petals 5, subequal ; stamens very numerous ; ovary shortly stipitate, villous ; fruit about 13 cm. long, 3 cm. broad, scythe-shaped, acute at one side .. .. *Dinklagei*

P. Dinklagei *Harms* l.c. ; Stapf 599. Flowers fairly large in a stout panicled raceme, sweet-scented ; petals white ; stamens very numerous.
Liberia : Grand Bassa (Sept.) ! Exsicc.—*Dinklage* 1687 ; 1755.

22. ISOBERLINIA Craib & Stapf in Kew Bull. 1912 : 93.

Branchlets, leaflets and inflorescence softly tomentellous ; leaflets 4 pairs, ovate or elliptic, rounded at the apex and base, 8–15 cm. long, 5–9 cm. broad, with 7–8 pairs of lateral nerves ; stipules very large and cordate-auriculate, unequally 2-lobed at the apex, about 3·5 cm. long and broad, tomentose, soon falling off ; bracts ovate, tomentose, 7–8 mm. long ; flowers subsessile, obovoid in bud, the two enclosing bracteoles about 1·3 cm. long, densely tomentose ; petals subequal, scarcely exceeding the bracteoles ; fruit woody, obliquely oblong, flat, about 25 cm. long and 8 cm. broad, brown-velvety-pubescent .. .. 1. *Dalzielii*

Branchlets and leaflets glabrous ; leaflets usually 3 pairs and subopposite or occasionally more numerous and alternate, ovate or elliptic, unequally rounded or slightly cuneate

FIG. 132.—POLYSTEMONANTHUS DINKLAGEI *Harms* (CAESALPINIACEAE).
A, bracteole. B, sepal. C, petal. D, anther. E, ovary.

at the base, up to 20 cm. long and 10 cm. broad, shining and closely reticulate on both sides, with 6–7 pairs of lateral nerves ; bracts ovate, keeled, tomentellous, about 4 mm. long ; flowers subsessile ; bracteoles about 1 cm. long, thick, tomentellous outside ; petals and fruit as above, but the latter glabrous or nearly so 2. *doka*

1. **I. Dalzielii** *Craib & Stapf* in Kew Bull. 1912 : 93. A medium-sized tree with grey or ochraceus puberulous foliage and branchlets, bark exuding a red resin, comparatively small white fragrant flowers and large 5–6-seeded pods which burst with curling valves scattering the seeds.
Togo : Sokode-Basari ! N. Nigeria : fairly common in deciduous woodland. Exsicc.—*Dalz.* 26. *Dudgeon* 8. *Shaw* 96. *Kersting* A 702. (See Appendix).

2. **I. doka** *Craib & Stapf* l.c. 94 ; Hook. Ic. Pl. t. 3003. *Berlinia Kerstingii* Harms. *B. angolensis* A. Chev. Bot. 230, not of Welw. A tree similar to the last but with glabrous shining foliage ; often gregarious.
French Guinea : Kankan and Kouroussa ! Ivory Coast : Mt. Dourou, 3,500 ft. (May) ! Mankano (July) ! Gold Coast : Kintampo (Mar.) ! Kwahu (fr. Jan.) ! Wa ! Togo ! Dahomey : Kouandé to Konkobiri ! N. Nigeria : very abundant in deciduous woods and on the edge of the forest zone ! S. Nigeria : Lagos Colony ! Extends to Cameroons and Upper Nile region. Exsicc.—*Dalz.* 12 ; 45 ; 334 ; 364. *Dudgeon* 9. *Rowland.* *Kersting* A 389. (See Appendix).

23. DANIELLIA Bennett—F.T.A. 2 : 299.

Filaments glabrous ; midrib of leaflets usually pubescent below ; leaflets up to 9 pairs, ovate, unequal-sided and broadly rounded at the base, obtusely acuminate, 7–15 cm. long, 4–8 cm. broad, with numerous looped lateral nerves and reticulate ; flowers numerous in lax panicles ; calyx glabrous, the lobes 1·5 cm. long ; fruit obliquely elliptic, flat, 7 cm. long, 3·5 cm. broad, glabrous .. .. .. 1. *Oliveri*

Filaments pubescent :

Rhachis and midrib of leaflets below softly pubescent ; leaflets about 5–6 pairs,

oblong-elliptic, subcordate at the base and unequal-sided, shortly acutely acuminate, 7–13 cm. long, 3–5 cm. broad, with numerous arcuate subparallel lateral nerves, strongly reticulate below ; calyx glabrous or nearly so outside, lobes broadly elliptic, 1·3 cm. long ; seeds flattish, oblong-elliptic, 3 cm. long .. 2. *pubescens*

Rhachis and midrib of leaflets below glabrous :

Leaflets with very numerous (about 30 pairs) lateral nerves closely parallel and spreading at right angles, abruptly caudate-acuminate, acumen rounded at the apex, 10–12 cm. long, 3–5 cm. broad ; petiolules about 1 cm. long, wrinkled ; outer sepals pubescent, about 1·5 cm. long ; ovary tomentose ; fruit obliquely elliptic, 7 cm. long, 3 cm. broad, glabrous .. .. 3. *caudata*

Leaflets with much fewer pairs of lateral nerves, the latter ascending and looped, with smaller nerves between and reticulate, more or less gradually acuminate, acumen acute :

Ovary glabrous ; leaflets 7–8 pairs, oblong or oblong-elliptic, rather abruptly acuminate, unequal-sided at the base, 6–8 cm. long, 2·5–6 cm. broad, glaucous-green and reticulate below ; calyx-lobes glabrous, closely marked with resinous dots ; fruits obliquely elliptic, 7 cm. long, glabrous .. .. .. 4. *thurifera*

Ovary pubescent or tomentose :

Leaflets (about 7–9 pairs) with 8 or more pairs of lateral nerves with secondary ones between :

Leaflets very thin, elongate-oblong, very acutely acuminate, very unequal at the base, 10–16 cm. long, 3–5 cm. broad, laxly reticulate ; calyx-lobes tomentose, 1·4 cm. long .. .. 5. *Fosteri*

Leaflets leathery, oblong-lanceolate, very shortly acuminate, 7–12 cm. long, 2·5–4 cm. broad, strongly reticulate ; calyx-lobes tomentose, 1·5 cm. long ; fruits obliquely oblong, 7 cm. long .. .. 6. *similis*

Leaflets with less than 8 pairs of lateral nerves, without distinct intermediate nerves and rather strongly reticulate between :

Leaflets oblong-lanceolate, gradually acuminate, more or less cuneate at the base, 6–8 cm. long, 2·5–3 cm. broad ; calyx-lobes about 1 cm. long, shortly pubescent ; fruits 7 cm. long, 3·5 cm. broad .. .. 7. *Ogea*

Leaflets broadly elliptic, rather abruptly acuminate, obliquely rounded at the base, about 12 cm. long and 6 cm. broad, laxly reticulate ; calyx-lobes tomentellous, about 1 cm. long .. .. 8. *Punchii*

1. **Daniellia Oliveri** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Paradaniellia Oliveri* Rolfe in Kew Bull. 1912 : 96 (which see for full synonymy) ; Holl. 2 : 270. *D. thurifera* A. Chev. Bot. 231, not of Bennett. A large tree 50–80 ft. high, with copious rather flat panicles of white, scented flowers and smooth pale flat one-seeded pods of horny consistence ; more characteristic of savannah and deciduous forests.
French Sudan : several localities ! Senegal : Casamance (Feb.) ! Gambia ! French Guinea : Futa Jallon ! Gold Coast : Kwahu (Jan.) ! Krobo Plains (Dec.) ! N. Nigeria : a very common deciduous tree (Dec., Jan.) ! S. Nigeria : Ishan country (Jan.) ! Onitsha (Feb.) ! Lagos Colony ! Also in French Cameroons, Ubangi-Shari and E. Sudan. Exsicc.—*Heudelot* 364. *Barter* 978. *Elliott* 14. *Johnson* 501. H 1332 1912. *Dennett* 102. *Dudgeon* 62 ; 101. *Foster* 151. *Unwin* 23. *Chev.* 96 ; 286 ; 2968 ; 12872 ; 20243 ; 20262 ; 24700. (See Appendix).
2. **D. pubescens** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A resin-producing tree.
S. Nigeria : Lagos Colony ! Exsicc.—*Moloney.* (See Appendix).
3. **D. caudata** *Craib* in Kew Bull. 1912 : 94. A large tree reaching 100 ft. bole and 25 ft. girth, deciduous, with flat crown and blue flowers.
S. Nigeria : Central Prov., Agogidigbo (Dec.) ! Also in Ondo and Ogoja. Exsicc.—*Unwin* 179. (See Appendix).
4. **D. thurifera** *Bennett.*—F.T.A. 2 : 300, partly ; Holl. 2 : 269. *D. oblonga* Oliv. ; Chev. Bot. 231. *D. Caillei* A. Chev. Bot. 230, name only. *Cyanothyrsus oblongus* Harms. A large tree up to 150 ft. or more high, with cylindrical bole, chiefly in evergreen forest, the older trees having rugose bark and smaller leaflets ; flowers bluish.
Senegal : Casamance (Feb.) ! French Guinea : Bilima (Dec.) ! Kouria, on hills (Jan.) ! Longuery, at edge of marsh (Dec.) ! Sierra Leone : a common tree ! Ivory Coast : Alépé (Mar.) ! Sanvi (Apr.) ! Yapo (Oct.) ! S. Nigeria : Lagos Colony ! Degema ! Fernando Po (Jan.) ! Exsicc.—*Daniell. Melville. Barter* 2074. *Mann* 166. *Moloney. Talb.* 3677. *Chev.* 2967 ; 2969 ; 22360. *Caille* in *Herb. Chev.* 14806 ; 14827 ; 15108. (See Appendix).
5. **D. Fosteri** *Craib* l.c. 95 ; Holl. 2 : 268. A tree ; branchlets with smooth greenish bark.
S. Nigeria : Lagos Colony, Mamu Reserve (Dec.) ! Ijebu Ode ! Exsicc.—*Foster* 156. *Millson* 37. (See Appendix).
6. **D. similis** *Craib* l.c. 95 ; Holl. 2 : 269. A large evergreen tree ; branchlets with red-brown bark ; flowers violet or purple.
Liberia : Banga (Oct.) ! Gold Coast : Tanosu ! Obuasi ! Birrim (Nov.) ! Kumasi ! Exsicc.—*Imp. Inst.* (1909). *Armitage* 107a, b, c. *Thompson* 39. *Chipp* 370 ; 670. *Dudgeon* 5. *Linder* 1233. (See Appendix).
7. **D. Ogea** *Rolfe* in Kew Bull. 1912 : 97. *Cyanothyrus Ogea* Harms. A large tall tree ; flowers bluish.
S. Nigeria : Ijebu Ode (" plentiful in the interior ") ! Exsicc.—*Millen* 191. (See Appendix).
8. **D. Punchii** *Craib* l.c. 95. A large forest tree.
S. Nigeria : Ibadan Forest Reserve (Nov.) ! Exsicc.—*Punch* 115 (See Appendix).

24. MONOPETALANTHUS Harms in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 1 : 195.

Leaflets not emarginate at the apex :

Leaflets about 20 pairs, opposite, oblong, broadly auriculate on the lower side, curved to a small black sublateral tip at the apex, 3 cm. long, 0·8 cm. broad, rather closely reticulate below, glabrous ; rhachis densely fulvous-tomentose, the leaflets con-

tiguous ; stipules persistent, 3 cm. long, produced into a broad base, closely venose-striate, glabrous ; racemes about 5 cm. long, densely velvety all over ; pedicels 5–7 mm. long ; bracteoles 8 mm. long ; petal ½ as long again ; young fruit densely villous .. .. 1. *pteridophyllum*

Leaflets about 20 pairs, as above, but much smaller, up to 1 cm. long and 2·5 mm. broad, rounded at the apex, glossy above, venose beneath ; rhachis slightly pubescent ; racemes cone-like when young, covered with densely overlapping striate fringed bracts, the uppermost silky-tomentose ; bracteoles 3–4 mm. long, pubescent ; petal a little longer ; stamens 8 .. .. 2. *compactus*

Leaflets emarginate at the apex, mucronate, about 10–11 pairs, narrowly oblong, auriculate on the lower side, 1–1·3 cm. long, 3–4 mm. broad, glabrous, shining above,

FIG. 133.—MONOPETALANTHUS COMPACTUS *Hutch.* (CAESALPINIACEAE).

A, portion of leaf showing attachment of leaflets. B, flower. C, petal. D, E, calyx-lobes F, stamens. G, pistil.

midrib prominent on both surfaces ; flowers not seen, but rhachis of inflorescence rusty-tomentose ; fruits oblong-elliptic, shortly stipitate, about 6 cm. long and 3 cm. broad, rusty-tomentose ; seeds flat, broadly elliptic, 1·5 cm. long .. 3. *emarginatus*

1. **M. pteridophyllum** *Harms* l.c., name only, and in Engl. Bot. Jahrb. 26 : 266 ; Stapf 600. A large tree 60–90 ft. high, with spiny trunk, and white flowers in axillary rusty-tomentose racemes.
Sierra Leone : Njala, Tala River. Liberia : Grand Bassa, St. John's River ! Exsicc.—*Dawe* 562. *Dinklage* 1720.

2. **M. compactus** *Hutch.* ex *Lane-Poole*, Trees, Shrubs, Herbs and Climbers of Sierra Leone 64, name only. A large tree like the last.
Sierra Leone : Falaba (Apr.) ! Gichun (Apr.) ! Exsicc.—*Aylmer* 30 ; 226.

3. **M. emarginatus** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *M. pteridophyllum* A. Chev. Bot. 235, not of Harms. Large tree with small rusty-brown fruits.
Sierra Leone : banks of the Morro R. (fr. Jan.) ! Ivory Coast : Lower Sassandra, Soubré ! Exsicc.—*Unwin & Smythe* 42. *Chev.* 19174 bis.

25. BERLINIA Soland.—F.T.A. 2 : 292.

Posterior petal very large, about 15 cm. broad ; bracteoles glabrous within, elliptic, leathery, 4–5 cm. long, 2·5–3 cm. broad, rusty-tomentellous outside ; leaflets 3 pairs, the uppermost pair elongate-oblong, up to 40 cm. long and 11 cm. broad, glabrous, with very numerous lateral nerves, papery ; stipules very large, lanceolate, connate on one side for half their length, 6 cm. long, with a large reniform basal appendage ; fruits about 35 cm. long and 10–12 cm. broad, dark brown-tomentellous, with 3 strong nerves parallel with the margin .. .. 1. *splendida*

Posterior petal very much smaller than above ; leaflets usually much smaller :

Petals subequal in length, but the posterior one with a broader limb ; bracts very large and subpersistent, about 6 cm. long, enclosing the young flowers until opening, softly tomentellous ; leaflets 4 pairs, subopposite, elliptic or oblong-oblanceolate, obtusely acuminate, up to 20 cm. long and 7·5 cm. broad, with about 10 pairs of lateral nerves .. .. 2. *bracteosa*

Petals very unequal in length ; the posterior one much longer and broader than the others ; bracts usually caducous :

Calyx-tube densely tomentose or pubescent outside, lobes silky outside :

Pedicels considerably longer than the bracteoles, the latter very broadly obovate, scurfy-puberulous inside, very thick and almost woody, about 4–5 cm. long ; leaflets 4–5 pairs, obovate-elliptic, acuminate, up to 18 cm. long and 7·5 cm. broad, with about 7–10 pairs of lateral nerves .. .. .. 3. *Craibiana*

Pedicels shorter or up to nearly as long as the bracteoles, the latter oblanceolate, about 6 cm. long, shortly pubescent inside ; calyx-lobes appressed-pilose outside, about 3 cm. long ; leaflets 3–4 pairs, elliptic-lanceolate, very long-tapered acuminate, up to 16 cm. long and 6 cm. broad, laxly reticulate ; claw of the posterior petal pubescent .. .. 4. *Hollandii*

Calyx-tube glabrous or very slightly pubescent down one side ; bracteoles obovate :

Bracteoles at most puberulous or shortly pubescent inside :

Calyx-lobes over 2·5 cm. long ; bracteoles in the open flower about 4 cm. long ; posterior petal not distinctly auriculate at the base ; leaflets usually 4 pairs, oblong, up to 25 cm. long and 8 cm. broad, reticulate .. 5. *grandiflora*

Calyx-lobes up to 1·5 cm. long ; bracteoles in the open flower usually not over 3 cm. long ; posterior petal markedly auriculate at the base ; leaflets 3–4 pairs, elliptic to ovate-elliptic, up to 18 cm. long and 8 cm. broad .. 6. *auriculata*

Bracteoles densely villous-tomentose inside, about 3 cm. long in the opening flower ; leaflets 3–5 pairs, elliptic-obovate, acuminate, up to 15 cm. long and 6 cm. broad, finely reticulate, glabrous except the midrib and petiolule ; inflorescence softly tomentellous ; fruits tomentellous .. .. 7. *Heudelotiana*

1. **Berlinia splendida** *A. Chev.* Bot. 230, name only. A medium-sized tree found in swamps, with very large white fragrant flowers.
Ivory Coast : Middle Cavally, Tébo village and neighbourhood (July). Gold Coast : Western Prov., Ajakwa ! Namachere, east of Tarkwa (May) ! Cape Coast district (May-June) ! Exsicc.—*Chipp* 206 ; 234. *Vigne* 935.

2. **B. bracteosa** *Benth.*—F.T.A. 2 : 294. *Westia bracteosa* Macbride. A tree 40 ft. high, glabrous except on the hoary puberulous inflorescence ; flowers white, crowded in a stout terminal raceme.
Gold Coast : Axim ! S. Nigeria : Oban ! Victoria ! Fernando Po ! Also in French Cameroons and Gabon. Exsicc.—*Mann* 1434. *Burton & Cameron. Winkler* 1087.

3. **B. Craibiana** *Bak. f.* in Cat. Talb. Nig. Pl. 27. *B. Preussii* De Wild. A tree 100 ft. or more high ; flowers large white in an ochraceus-pubescent panicle.
S. Nigeria : Calabar (Feb.) ! Oban ! Cameroons River (Jan.) ! Victoria ! Also in French Cameroons. Exsicc.—*Mann* 733 ; 2302. *Thomson* 13. *Talb.* 1520 ; 1524 ; 1584 ; 1732. *Preuss* 1317.

4. **B. Hollandii** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A tree 20–30 ft. high ; panicle pale fuscous puberulous.
S. Nigeria : Calabar (Mar.) ! Itu ! Exsicc.—*Holland* 10 ; 30.

5. **B. grandiflora** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Westia grandiflora* Vahl ; Macbride in Contrib. Gray Herb. 59 : 20 (1919). *B. acuminata* Sol.—F.T.A. 2 : 293 ; Stapf 600 ; Holl. 2 ; 266 ; Chev. Bot. 229. A tree, reaching 80 ft. in height in the forest, with spreading crown ; flowers fragrant, in pale brown puberulous racemes, the large petal 2–2½ in. across, white with a red central streak ; pods brown, woody, 6–10 in. long, 3 in. wide, projecting at an angle from the branch, with 2–5 large flat seeds.
Sierra Leone : Kambui Reserve (Apr.) ! Liberia : Bassa Cove ! Gold Coast : Princes Town, near the sea (Apr.) ! S. Nigeria : Abukpani, north of Calabar (Feb.) ! Also in French Cameroons. Exsicc.—*Ansell. Chipp* 173. *Lane-Poole* 244. (See Appendix).

6. **B. auriculata** *Benth.*—F.T.A. 2 : 294. *Westia auriculata* Macbride. A tree 25 to 30 ft. high, resembling the last.
Sierra Leone : Laoma (Apr.) ! Njala (Apr.) ! Liberia : Monrovia ! S. Nigeria : Eket ! Oban ! Degema ! Cross River ! Cameroons River (Jan.) ! Rio del Rey ! Extends to Gabon. Exsicc.—*Mann* 2195. *Johnston. Whyte. McLeod. Talb.* 79 ; 3110 ; 3340 ; 3611. *Deighton* 647. *Dunstan. Aylmer* 223. (See Appendix).

7. **B. Heudelotiana** *Baill.* Adans. 6 : 185, t. 3, figs. 8, 9. *B. acuminata* var. *Heudelotiana* Oliv.—F.T.A. 2 : 294. *B. auriculata* A. Chev., not of Benth. A large tree often confused with *B. grandiflora* ; inflorescence whitish hoary.
In forest and in evergreen belts and fringes of the open country ; from Senegal to Cameroons. Exsicc.—*Hewletot* 886. *Barter* 3327. *Rowland. Millen* 142. *Dennett* 1 ; 6. *Chipp* 258. *Burton & Cameron. Johnston, Elliott* 2. *Dalz.* 34 ; 601. *Lely* 819. *Pobéguin* 861. *Baumann* 122. *Kersting* 33. *Chev.* 612. (See Appendix).

26. AFZELIA [1] Smith.—F.T.A. 2 : 301.

Bracts large, about 1 cm. long, ovate-lanceolate, persistent up to the time of flowering or longer, soon reflexed ; leaflets 3–4 pairs, oblong, slightly curved, obtuse or rounded at the apex, 6–11 cm. long, 3–4 cm. broad, glabrous ; calyx-lobes ovate-elliptic, about 1 cm. long, mealy-pubescent ; petal about 3–4 times as long as the calyx-lobes, the claw glabrous or nearly so ; fruits oblong, curved, 12 cm. long, 5 cm. broad, several-seeded ; seeds with a thin orange-coloured cupular aril reaching high up . . . . . 1. *bracteata*

Bracts deciduous before flowering, usually very small and inconspicuous :

Petal only 1½–2 times as long as the calyx-lobes ; leaflets very broadly elliptic or oblong-elliptic, rounded or obtusely acuminate, 6–12 cm. long, 4–7 cm. broad, glabrous, often shining on the upper surface, conspicuously reticulate ; flowers small, in spreading panicles ; calyx-lobes about 0·5 cm. long, softly pubescent ; fruits thick, hard, oblong, about 15 cm. long and 7 cm. broad ; seeds black, about 2 cm. long, with a large fleshy orange-red cupular aril at the base .. .. 2. *africana*

Petals 3 or more times as long as the calyx-lobes ; leaflets more or less oblong :

Leaflets 3–6 pairs, glabrous below, shortly acuminate, 6–12 cm. long, 2·5–5 cm. broad, bright green :

Petal with a glabrous or nearly glabrous claw ; calyx-lobes finely puberulous outside, 1·5 cm. long ; fruit curved, about 14 cm. long ; seeds with a large orange aril closely appressed to the testa, bilobed, one half reaching nearly to the top of the seed .. .. 3. *bella*

Petal with a pubescent claw ; calyx tomentellous outside ; lobes 1·5 cm. long . . . . . 4. *bipindensis*

Leaflets about 8 pairs, pubescent below, especially on the midrib, rounded or emarginate at the apex, 5–7 cm. long, 2–2·5 cm. broad ; petal with a rather densely pubescent claw ; calyx-lobes pubescent outside, about 1 cm. long .. 5. *Zenkeri*

1. **Afzelia bracteata** *T. Vogel*—F.T.A. 2 : 301 ; Holl. 2 : 273 ; Chev. Bot. 232. *Pahudia bracteata* Prain. A medium-sized tree, usually found by streams ; flowers scarlet.
French Guinea : Futa Jallon ! Sierra Leone : Freetown (June–July) ! Bagroo R. (Apr.) ! Talla Hills (Apr.) ! Binkolo (fr. Aug.) ! Kessewe (May) ! Pujehun (June) ! Ivory Coast : Morénou (Dec.) ! Exsicc. —*T. Vogel. Heudelot* 882. *Afzelius. Smeathmann. Mann* 890. *Sc. Elliot* 5533. *Thomas* 911 ; 1252 ; 1350 ; 1808. (See Appendix).
2. **A. africana** *Smith*—F.T.A. 2 : 302 Guill. & Perr. Tent. Fl. Seneg. 1 : 263, t. 57 ; Holl. 2 : 272 ; Chev. Bot. 231 ; Engl. Pflanzenw. Afr. 3, 1 : 458, fig. 251. *Pahudia africana* Prain. A tree 40–60 ft. high, with comparatively small very fragrant flowers ; petal white or greenish with purple markings ; bark scaling like the plane tree ; chiefly in savannah, but also in mixed deciduous forests.
From Senegal to Cameroons ; extending to Upper Congo and Nile regions. Exsicc.—*Heudelot* 767. *Barter* 1218. *Sc. Elliot* 5106. *Rowland. Johnson* 698. *Foster* 10. *Mildbraed* 7414 ; 7457. (See Appendix).
3. **A. bella** *Harms* in Engl. Bot. Jahrb. 49 : 425. *A. microcarpa* A. Chev. A tree with glabrous branchlets and large flowers, the petal white with a red streak or red blotches on the claw.
French Guinea : Konakry and Iles de Los ! Ivory Coast : Dabou ! Bouroukrou ! S. Nigeria : Benin ! Assaba ! Calabar ! Degema ! Eket ! Aguku ! Barombi (Aug.) ! Victoria. Also in French Cameroons and Belgian Congo. Exsicc.—*Holl.* 56. *Thompson* 26 ; 516 (seed). *Unwin* 28 ; 127 *Leslie* 35 ; 38. *Thomas* 917 ; 1778. *Talb.* 3341 ; 3346 ; 3807. *Chev.* 16207 ; 16589. (See Appendix).
4. **A. bipindensis** *Harms* l.c. 426. A tree up to 90 ft. high, with glabrous brown-black branchlets.
S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Talb.* 1650.
5. **A. Zenkeri** *Harms* l.c. 427. A large tree, 60 ft. or more ; branchlets slightly pilose ; petal scarlet.
S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Talb.* 1468.

27. MACROLOBIUM Schreb.—F.T.A. 2 : 297.

Leaflets quite glabrous below :

Leaflets about 5–7 pairs :

Bracteoles 3 cm. long or more :

Bracteoles glabrous outside, broadly oblong-elliptic, about 3 cm. long and 1·8 cm. broad, leathery, softly tomentellous inside ; stipules intrapetiolar, oblong, resembling a detached piece of bark ; leaflets about 5 pairs, lanceolate to oblong-elliptic, acutely acuminate, 5–10 cm. long, 1·8–4 cm. broad, chartaceous, closely reticulate on both surfaces ; ovary densely tomentose ; fruit flat, oblong, about 14 cm. long and 4 cm. broad, closely warted .. .. 1. *Dawei*

Bracteoles rusty-puberulous, 3·5 cm. long, 2·3 cm. broad ; leaflets oblong to narrowly obovate, up to 25 cm. long and 9 cm. broad, glabrous ; raceme as long as or longer than the leaves ; pedicels 1·5 cm. long ; 1 petal, very large, with a thick glabrous claw and large limb about 7 cm. long ; fruits oblong, 17 cm. long, 5 cm. broad, rusty-tomentellous, with a rib 1 cm. from one margin .. 2. *Chevalieri*

Bracteoles below 1·5 cm. long, pubescent :

Leaflets 7 pairs, oblong-oblanceolate, unequal-sided, acuminate, obliquely rounded at the base, up to 15 cm. long and 4·5 cm. broad, glabrous and reticulate below, with numerous prominently looped lateral nerves ; panicles with few long branches,

[1] In accordance with the International Code of Nomenclature, we are able to retain the genus *Afzelia* Smith, because *Afzelia* Gmelin is synonymous with *Seymeria* Pursh (*Scrophulariaceae*), and *Seymeria* is on the list of *nomina conservanda*. Although Prain has united *Afzelia* with the Asiatic *Pahudia* Miq., it seems possible to regard it as generically distinct, for even under *Pahudia* it retains its entity according to Prain's classification.

FIG. 134.—AFZELIA AFRICANA *Smith* (CAESALPINIACEAE).
A, flower-bud. B, flower. C, longitudinal section of fruit.

laxly tomentellous; pedicels 1·3 cm. long; bracteoles broadly elliptic, 1·3 cm. long, rusty-puberulous .. .. 3. *obliquum*

Leaflets 5 pairs, obovate-oblanceolate, long-cuneate at the base, shortly acuminate, up to 16 cm. long and 5 cm. broad, glabrous, with numerous rather faint lateral nerves, finely reticulate; stipules persistent, reniform, leafy, about 2·5 cm. long; pedicels up to 2 cm. long; bracteoles about 1 cm. long, tomentellous 4. *bilineatum*

*Leaflets 1–4 pairs :

Leaflets 2–4 pairs :

Inflorescence short, more or less orbicular in outline :

Bracteoles of the opening flower 1·5 cm. long, rusty-tomentose; stipules reniform, leafy; leaflets 2–4 pairs, elliptic-obovate, apiculate, unequal-sided at the base, up to 30 cm. long and 10 cm. broad, glabrous, the midrib prominent on both sides; pedicels up to 2 cm. long .. .. 5. *Limba*

Bracteoles up to 1 cm. long; stipules (when present) lanceolate or ovate :

Leaflets 3–4 pairs :

Stipules more or less persistent, large and leafy, acute, about 2·5 cm. long; leaflets 3–4 pairs, oblong or oblong-oblanceolate, oblique at the base, up to 22 cm. long and 7·5 cm. broad, with numerous looped lateral nerves; inflorescence rather dense; pedicels about 1 cm. long, rusty brown-tomentose .. .. 6. *Talbotii*

Stipules deciduous; leaflets 4 pairs, oblong-oblanceolate, subequal at the base, 10–20 cm. long, 3–6 cm. broad, with numerous rather obscure lateral nerves, finely reticulate below; inflorescence lax; pedicels 1-1·5 cm. long, tomentellous .. .. 7. *Preussii*

Leaflets 2 pairs; stipules deciduous (not seen); leaflets obovate to oblanceolate, acuminate, unequal-sided at the base, up to 17 cm. long and 7 cm. broad, sometimes much smaller and narrow, glabrous, with rather few lateral nerves, reticulate below; branches of inflorescence rather slender; pedicels up to 1·3 cm. long; fruits with a longitudinal nerve near one margin, glabrous 8. *Aylmeri*

Inflorescence much elongated, with short lateral branchlets :

Bracteoles in the opening flower about 5–8 mm. long, velvety-tomentose; flowers subfasciculate on very short lateral branchlets; pedicels up to 8 mm. long; leaflets 3 pairs, ovate or oblong-elliptic, acuminate, up to 10 cm. long and 5 cm. broad, glabrous; lateral nerves about 6 pairs; fruit flat, 15 cm. or more, curved, with oblique raised nerves, velvety .. 9. *Heudelotii*

Bracteoles 1 cm. long or more; lateral branchlets of inflorescence distinct :

Stipules persistent, oblanceolate, obtuse, leathery, 5–7 mm. long; leaflets 2 pairs, ovate to obovate, glossy, very abruptly acuminate, up to 11 cm. long and 6 cm. broad; lateral nerves about 5 pairs; inflorescence up to 30 cm. or more long .. .. 10. *elongatum*

Stipules small and inconspicuous; leaflets 3–4 pairs, mostly obovate or elliptic, more or less cuneate at the base, up to 16 cm. long and 7 cm. broad, glabrous, with about 6 pairs of lateral nerves; inflorescence sometimes very long 11. *obanense*

Leaflets 1 pair, obliquely oblong-oblanceolate, with a twisted apex, 12–20 cm. long, 3–6 cm. broad, with several lateral nerves, distinctly reticulate on both surfaces, with a pair of cone-like stipellae at the base; petiole 5 mm. long; flowers rather crowded, the inflorescence up to 12 cm. long; bracteoles striate, about 8 mm. long, tomentellous .. .. 12. *diphyllum*

Leaflets covered with a close very short felt of hairs below or silky-tomentose :

Leaflets caudate-acuminate :

Leaflets more or less elongate-oblong, brownish silky below, up to 28 cm. long and 7 cm. broad, with numerous lateral nerves; branchlets brownish-tomentose; inflorescences on the wood of several years' growth; bracts silky-tomentose, about 1 cm. long .. .. 13. *lamprophyllum*

Leaflets elliptic to obovate, silvery below, up to 25 cm. long and 11 cm. broad, with rather few lateral nerves; branchlets grey, more or less glabrous; inflorescences on the young or 1–2 years' shoots; bracteoles puberulous, about 0·5 cm. long; fruits up to 30 cm. long, curved, 5–6 cm. broad, obliquely nerved, softly tomentellous .. .. 14. *macrophyllum*

Leaflets rounded at the apex or very slightly pointed, elongate-oblong-obovate, the uppermost pair up to 25 cm. long and 9 cm. broad, leathery, shortly tomentose below, with about 14–18 pairs of prominent lateral nerves below; panicles about 15 cm. long, with short lateral branchlets, rusty-tomentellous; bracteoles about 5 mm. long .. .. 15. *chrysophylloides*

1. **Macrolobium Dawei** *Hutch. & B. Dawy* in Kew Bull. 1928, ined. Medium-sized tree; stipules very remarkable, intrapetiolar; flowers crowded together.
Sierra Leone: Bunkababe (May)! Kennema (June)! Exsicc.—*Lane-Poole* 121. *Aylmer* 88. *Thomas* 10484. *Dawe* 28. *D. G. Thomas* T 44.
2. **M. Chevalieri** *Harms* in Notizbl. Berl. Bot. Gart. 8: 149. *Berlinia ivorensis* A. Chev. Bot. 230. A tree 60 ft. or more high, with glabrous branchlets and white fragrant flowers with large bracteoles.
Sierra Leone: Scarcies R., Kukuna! Ivory Coast: Lower Cavally, forest near Grabo (July)! Exsicc. —*Chev.* 19645. *Sc. Elliot* 4221. *Thomas* 498.
3. **M. obliquum** *Stapf* in Journ. Linn. Soc. 37: 96; Johnston, Liberia 2: 599. A shrub with pinnate leaves and rusty panicles of white flowers.
Liberia: Sino Basin! Exsicc.—*Whyte*.
4. **M. bilineatum** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A tree like the preceding, with copious brownish-tomentellous panicles; immature pods with two raised lines parallel to the margin.
Sierra Leone: Kahreni, Limba (Apr.)! Between Sellakuri and Yanga (Mar.)! Ivory Coast: Attié, near Yacassé (fl. and fr. Dec.)! Exsicc.—*Sc. Elliot* 5070; 5588. *Chev.* 22662.
5. **M. Limba** *Scott Elliot* in Journ. Linn. Soc. 30: 77; Chev. Bot. 228. *M. ivorense* A. Chev. Bot. 228, name only. A tree 40 ft. or more high, with brown-velvety panicles of white flowers and pods 6–8 in. long, 1½–2 in. broad, with a prominent line along the middle.
Sierra Leone: Limba country, Kafogo, Kurusu (Apr.)! Matotoka (fr. July)! Glehun (Apr.)! Falaba! Ivory Coast: Grabo (July)! Gold Coast: Huni Valley (May)! Kwae, Obuasi-Kibbi road (fr. Feb.)! Exsicc.—*Sc. Elliot* 5539; 5606. *Lane-Poole* 75, partly. *Thomas* 1258; 2111. *Burbridge* 475. *Aylmer* 222. *Chipp* 220. *Brent* 405. *Chev.* 19671. (See Appendix).
6. **M. Talbotii** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *M. demonstrans* Oliv. var. *Talbotii* Bak. f. A tree 20–25 ft. high.
S. Nigeria: Oban! Exsicc.—*Talb.* 1284; 1504.
7. **M. Preussii** *Harms* in Engl. Bot. Jahrb. 26: 272. A tree.
S. Nigeria: Barombi Lake (Aug.)! Exsicc.—*Preuss* 449.
8. **M. Aylmeri** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A tree with rusty-brown paniculate flowers.
Sierra Leone: Freetown, Colonial Reserve (Jan.)! Commendi (Nov.)! Buri Town! York, near mangrove swamp (Nov.)! Exsicc.—*Aylmer* 263. *Unwin & Smythe* 9. *Lane-Poole* 80; 423. *King-Church* 8.
9. **M. Heudelotii** *Planch.*—F.T.A. 2: 298; Chev. Bot. 228. A medium-sized tree or sometimes a half-climbing shrub.
French Guinea: Rio Nunez. Futa Jallon! Kindia. Sierra Leone: head of Scarcies River, Kora (fr. Feb.)! Bíama (Dec.)! Exsicc.—*Heudelot* 738. *Sc. Elliot* 4800. *Deighton* 309. (See Appendix).
10. **M. elongatum** *Hutch.* in Kew Bull. 1916: 229. A small branching tree, with long narrow finely brownish-puberulous pendulous inflorescences of white flowers.
Sierra Leone: Pujehun (Feb.)! Exsicc.—*Lane-Poole* 161.
11. **M. obanense** *Bak. fil.* in Cat. Talb. Nig. Pl. 28. A medium-sized tree with usually long racemose-paniculate fulvous-pubescent inflorescence.
S. Nigeria: Oban! Ububulu. Exsicc.—*Talb.* 582; 1428; 1468. *Thomas* 2260; 2262.
12. **M. diphyllum** *Harms* in Engl. Bot. Jahrb. 30: 84 (1901). A shrub or tree with white flowers in rusty-tomentellous panicles; pods 5–6 in. long, 2 in. broad, glabrous.
S. Nigeria: Eket! Also in French Cameroons. Exsicc.—*Talb.* (no number).
13. **M. lamprophyllum** *Harms* l.c. 85. A shrub or tree up to over 30 ft. high, with brown-silky usually elongated inflorescences of white flowers.
S. Nigeria: Oban! Also in Cameroons. Exsicc.—*Talb.* 1272; 1656.
14. **M. macrophyllum** *Macbride* in Contrib. Gray Herb. 59: 21 (1919). *M. Palisoti* Benth.—F.T.A. 2: 297; Holl. 2: 267; Stapf 600; Chev. Bot. 228; P. de Beauv. Fl. Owar. 1: 71, t. 42. A tree reaching sometimes 30–50 ft., in forests or on edges of streams; flowers white turning yellow, in brown-tomentellous paniculate racemes; pods with about 4 or more flat dark brown seeds, 1–1½ in. in diameter.
Common in the coastal and forest areas from French Guinea to Cameroons and Fernando Po; north to Lokoja, N. Nigeria; extending to Angola. Exsicc.—*Heudelot* 753. *Barter* 1624, partly. *Mann* 259. *Moloney* 11. *Sc. Elliot* 3826; 3905. *Millen* 30. *Thomson* 67. *Talb.* 3655; 3656. *Chev.* 14937; 20808; 22449. *Poéguin* 588; 840. (See Appendix).
15. **M. chrysophylloides** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A large tree.
Sierra Leone: Commendi-Gengaru (Nov.)! Ivory Coast: Middle Comoe, between Bébou and Mbasso! Exsicc.—*Aylmer* 261. *Chev.* 22648.

Imperfectly known Species.

M. crassifolium *A. Chev.* Bot. 228, name only.
French Guinea: Labé! Exsicc.—*Chev.* 12373.
The specimen in Herb. Chevalier is flowerless, and is probably not a *Macrolobium*.

28. CRYPTOSEPALUM Benth.—F.T.A. 2: 303.

Leaflets 11–15 pairs, narrowly oblong, auriculate on one side, about 1 cm. long, glabrous; flowers very small, in short racemes; bracteoles 5 mm. long, deciduous; pedicels slender, 8 mm. long, glabrous; ovary stipitate, ciliate .. .. .. 1. *Staudtii*

Leaflets 1–2 pairs:

A tree; leaves abruptly pinnate; leaflets 2 pairs, opposite, very obliquely elliptic, shortly acuminate, the lower pair small, the upper ones up to 5 cm. long and 2 cm. broad, the midrib near the inner side and hirsute in the lower part below; rhachis very short, pubescent; racemes axillary, shorter than the leaves; flowers small; pedicels up to 1 cm. long, glabrous; bracteoles obovate-elliptic, 5–6 mm. long, glabrous outside; petal 1, small; stamens 3; ovary densely hairy on the margin; fruits glabrous .. .. 2. *tetraphyllum*

A tree; leaflets 1 pair, obliquely elliptic, obtusely pointed, 1·8–2·2 cm. long, 8–9 mm. broad, slightly ciliate on the margin and midrib, at length glabrous; petiole pubescent; racemes slender, 1–2·5 cm. long; pedicels slender, 6–10 mm. long, glabrous; bracteoles broadly elliptic, concave, 3 mm. long; petals not seen; stamens 3 (?); ovary stipitate, villous on the margins .. .. 3. *minutifolium*

1. **C. Staudtii** *Harms* in Engl. Bot. Jahrb. 26: 267. A shrub with glabrous branchlets and perulate buds.
S. Nigeria: Johann-Albrechtshöhe (Mar.)! Exsicc.—*Staudt* 907.
2. **C. tetraphyllum** *Benth.*—F.T.A. 2: 303.—Trans. Linn. Soc. 25, t. 43, B. A large tree, conspicuous in flower with short axillary racemes white or pinkish.
Sierra Leone: Sugarloaf Mt., etc. (Apr., May)! Talla Hills, Ninia (Feb.)! Kurusu (Apr.)! Bumbu! Exsicc.—*Don. Barter* (no number). *Sc. Elliot* 4893; 5525; 5781. *Unwin & Smythe* 28. *Lane-Poole* 169. *Dawe* 735. (See Appendix).

3. **C. minutifolium** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Hymenostegia minutifolia* A. Chev. A mountain forest tree, 80–100 ft. high, with bole of 50–60 ft.; young leaves reddish; flowers subtended by small white bracts.
Ivory Coast: Middle Cavally; between Toula and Nikaougnié (July)! Exsicc.—*Chev.* 19579.

29. BRACHYSTEGIA Benth.—F.T.A. 2 : 305.

Leaflets about 8 pairs, lanceolate, 6–8 cm. long, 2–2·5 cm. broad, glabrous except for spreading hairs on the midrib below; flowers paniculate, rufous-tomentose; panicles about ½ the length of the leaves; pedicels very short; calyx about 1 cm. long; fruits oblong, very oblique at the base, beaked, about 16 cm. long and 5 cm. broad, with a flat band-like keel on one margin, glabrous .. .. 1. *leonensis*

Leaflets about 5 pairs, broadly elliptic, 7–9 cm. long, 3·5–5 cm. broad, strongly nerved and reticulate on both surfaces, glabrous except for the very shortly and sparingly pubescent midrib below; flowers as above; fruits woody, narrowly oblong, about 18 cm. long and 5 cm. broad, glabrous .. .. 2. *eurycoma*

1. **B. leonensis** *Hutch. & B. Davy* in Kew Bull. 1923 : 156. A tree 100–150 ft. high, with wide buttresses; the bark exudes a brown resin.
Sierra Leone: Kambui (Mar.)! Bandama! Gola Forest. Liberia: Du River (fr. Aug.)! Exsicc.—*Lane-Poole* 188. *Aylmer* 200. *Linder* 229. (See Appendix).
2. **B. eurycoma** *Harms* in Engl. Bot. Jahrb. 49 : 424; Hutch. & B. Davy l.c. 157. A large tree up to 150 ft. high, with scaly bark and brown woody pods 4–6-seeded; young foliage bright red.
Ivory Coast: Zaranou! 8. Nigeria: Oshogbo (Apr.)! Asaba! Awka! Onitsha! Benin! Calabar! Ikirun! Also in French Cameroons. Exsicc.—*Millson* (no numbers). *Chev.* 16283. *Conser. of Forests* 28. *Leslie* 40. *Unwin* 66. *Thomas* 78. (See Appendix).

30. DIDELOTIA Baill.—F.T.A. 2 : 307.

Leaflets 3–7 pairs:

Leaflets 5–7 pairs, small, up to 3 cm. long and 1·3 cm. broad, oblong, very oblique at the base on one side, emarginate, glabrescent except on the midrib; racemes short, in the axils of the upper, often much smaller leaves, forming an elongated leafy panicle: stipules intrapetiolar, united into one; pedicels up to 1·3 cm. long, tomentose; bracteoles 2, broadly ovate, tomentose outside, 4–5 mm. long 1. *Engleri*

Leaflets 3–4 pairs, larger, 5–8 cm. long, obliquely oblong, emarginate, shining, glabrous; racemes paniculate, elongated; pedicels 5–8 mm. long; bracteoles 2, suborbicular, shortly pilose outside .. .. 2. *Afzelii*

Leaflets 1 pair; flowers pedicellate, pedicels nearly 1 cm. long, shortly pubescent; leaflets together forming almost a circle, very oblique, acuminate, 7–13 cm. long, 3–6 cm. broad, glabrous; petiole 0·5–1 cm. long; racemes forming a long slender leafless panicle up to 20 or more cm. long; bracteoles obovate-elliptic 3. *africana*

1. **Didelotia Engleri** *Dinkl. & Harms* in Engl. Bot. Jahrb. 30 : 80; Stapf 600. A shrub or small tree; inflorescence narrow, drooping, up to 10 in. long; flowers scented, small, crimson, without petals.
Liberia: Grand Bassa, in moist woods near the sea (Sept.)! Exsicc.—*Dinkl.* 2033.
2. **D. Afzelii** *Taub.* in Engl. & Prantl, Nat. Pflanzenf. 3, 3 : 387, and in Engl. Bot. Jahrb. 26 : 266.
Sierra Leone. Exsicc.—*Afzelius.*
3. **D. africana** *Baill.*—F.T.A. 2 : 307; Baill. Adans. 5 : 367, t. 8. A tree with foliage like that of *Hymenaea Courbaril.*
S. Nigeria: Oban! Eket! Also in Gabon. Exsicc.—*Talb.* 1461; 3344.

31. MEZONEURUM Desf.—F.T.A. 2 : 260.

Woody climber, with short recurved prickles; leaves bipinnate; pinnae about 5 pairs, the axes prickly; leaflets alternate, about 5 pairs, elliptic, rounded at each end, 3–4 cm. long, 1·5–2·5 cm. broad, glabrous; racemes terminal, simple or branched, rather dense-flowered, tomentellous, up to about 20 cm. long; pedicels about 1 cm. long, articulated near the top; bracts small, very early caducous; lower calyx-lobe partially enclosing the others in bud, hood-like; petals 5; stamens 10, free; filaments pilose; fruits indehiscent, reflexed, flat and thin, linear-oblong, about 10 cm. long and 2–2·5 cm. broad, minutely puberulous, winged along one side *Benthamianum*

M. Benthamianum *Baill.*—F.T.A. 2 : 261; Chev. Bot. 219. Flowers yellow; pods bright red.
Senegal: Casamance. Gambia! French Guinea: Rio Nunez! Bouloukountou. Sierra Leone: common (Jan.)! Ivory Coast: Bouroukrou. Gold Coast: Afram Plains (fr. Jan.)! Togo: Chito (fr. Dec.)! Dahomey: Zagnanado (Feb.). S. Nigeria: Olokemeji! Exsicc.—*Heudelot* 962. *Brown-Lester* 32. *Oldfield. Sc. Elliot* 4519. *Chipp* 594. *Foster* 145. *Dalz.* 8406. (See Appendix).

32. CAESALPINIA Linn.—F.T.A. 2 : 262.

Scrambling shrub with very closely prickly branches and slender branchlets; leaves bipinnate, pinnae 4–7 pairs; rhachis prickly; leaflets oblong-elliptic, mucronate, 2·5–4·5 cm. long, 1·5–2·5 cm. broad, slightly pubescent; flowers paniculate; bracts linear, soon falling-off; axis and calyx tomentose; petals 5, oblong, yellow, subequal, about 1 cm. long; stamens 10, free, filaments villous towards the base; fruit oblong-elliptic, flattish, 6–7 cm. long, 4 cm. broad, very prickly with slender erect prickles, 1–2-seeded; seeds spherical, lead-coloured, smooth, about 1·5 cm. diam. .. *crista*

C. crista *Linn.* Sp. Pl. 380. *C. Bonducella* Fleming—F.T.A. 2 : 262; Stapf 598; Holl. 2 : 249; Chev. Bot. 220.

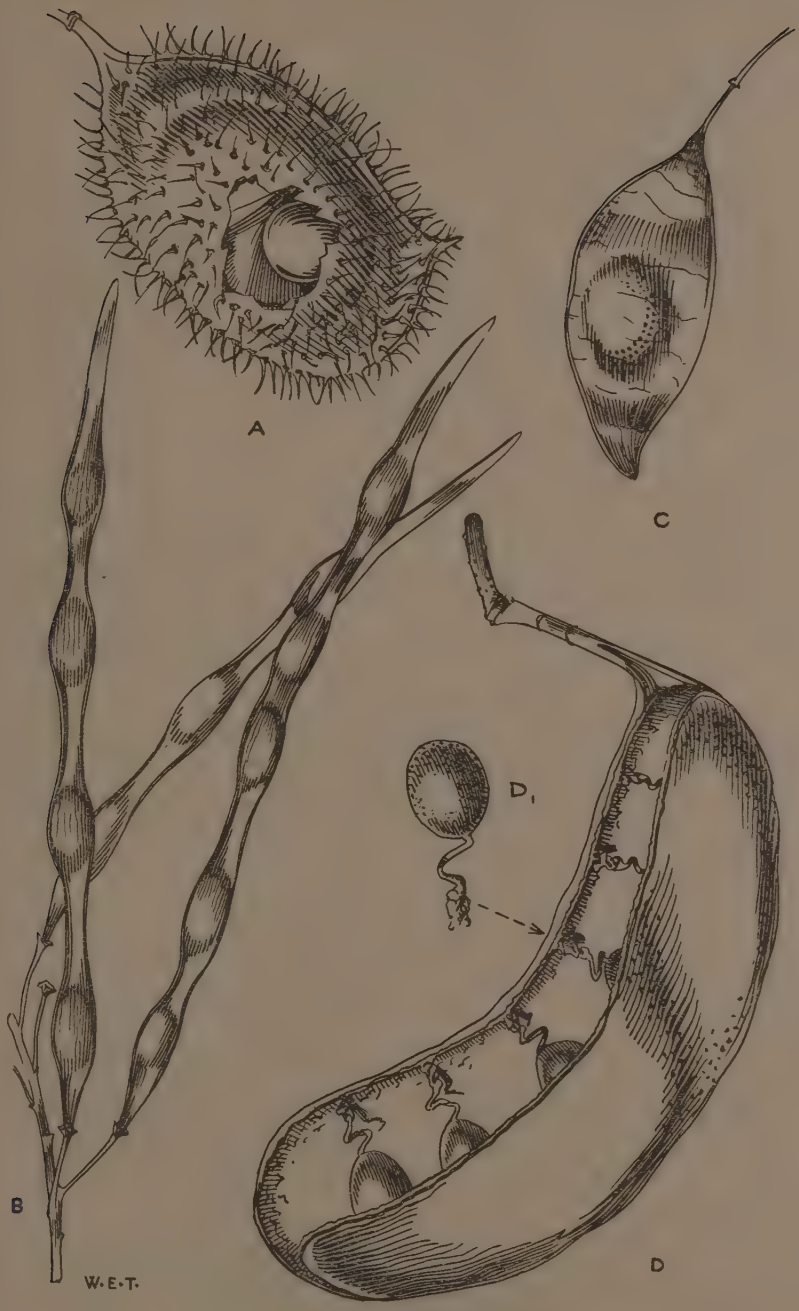

FIG. 135.—FRUITS OF CAESALPINIACEAE.

A, CAESALPINIA CRISTA *Linn.* B, PARKINSONIA ACULEATA *Linn.* C, BURKEA AFRICANA *Hook.* D, ERYTHROPHLEUM GUINEENSE *Don.* D_1, seed of same with funicle.

Originally a native of the coastal regions of both hemispheres, now naturalised near villages in the interior. (See Appendix).

C. pulcherrima Sw. is generally cultivated throughout the tropics; a small tree; branches not prickly; leaflets small, rounded at the apex and emarginate; flowers subcorymbose-cymose; petals broadly obovate, clawed, red or orange; fruit flat, linear-oblong, glabrous. Near Buea *C. sepiaria* Roxb. is semi-naturalised.

33. BUSSEA Harms in Engl. Bot. Jahrb. 33 : 159 (1902).

Large tree; leaves bipinnate; leaflets alternate, oblong-elliptic, very long-acuminate, 6–10 cm. long, 3–4 cm. broad, laxly reticulate, glossy above, glabrous; flowers racemose; racemes about 20 cm. long; pedicels up to 1 cm. long, tomentose; sepals triangular-ovate, subacute, about 8 mm. long, rusty-brown-tomentellous when dry; petals crinkly, obovate, about 2 cm. long; filaments and style densely villous; fruit narrowly oblanceolate, woody with strongly recurved valves, about 15 cm. long and 3·5 cm. broad, densely brown-ferruginous when young .. .. .. *occidentalis*

B. occidentalis *Hutch.* ex *Chipp*, Trees, Shrubs and Climbers of the Gold Coast, etc., 17, name only; Hutch. in Kew Bull. 1928, ined. A tree 70–80 ft. high, with dark brown-tomentose branchlets and inflorescence; flowers conspicuous, yellow: pods erect, elastic, curling up after opening.

Sierra Leone: Hangha (Aug.)! Gola forest! Liberia: Gbanga (Sept.)! Gold Coast: Dunkwa (Aug.)! Obuasi! Essuasu (May)! Akyempim, north east of Tarkwa (fr. May)! Kankan (June)! Exsicc.—*Chipp* 219; 715. *Lane-Poole* 394. *Thompson* 90. *Vigne* 170; 920. *Unwin & Smythe* 64. *Linder* 479. (See Appendix).

34. PELTOPHORUM Vogel—F.T.A. 2 : 260.

A tree; branchlets rusty-tomentose; leaves bipinnate, about 8-jugate; leaflets about 15–25 pairs, opposite, narrowly oblong, mucronate, about 7 mm. long, rather densely pubescent, especially on the margin; flowers in terminal simple or slightly branched racemes, rusty-tomentose; pedicels 1–1·5 cm. long, jointed near the apex; bracts subulate, about 5 mm. long; calyx-lobes glabrescent on the margins; petals 5, about 3 times as long as the sepals; stamens 10, free, filaments pilose; fruit indehiscent, flat, oblong-lanceolate, narrowed at each end, 1–2-seeded, about 7 cm. long and 2 cm. broad, thin and becoming submembranous .. .. .. *africanum*

P. africanum *Sond.*—F.T.A. 2 : 260; Chev. Bot. 219.

French Guinea: Konakry and Iles de Los. Futa Jallon, between Kouria and Irébéléya! Ivory Coast: in virgin forest between Middle Sassandra and Cavally R.! Exsicc.—*Chev.* 12245; 12246; 18268; 19212.

Native of South Tropical Africa and the Northern Transvaal and most probably introduced into our area.

35. PARKINSONIA Linn.—F.T.A. 2 : 266.

Small tree; branchlets armed with rigid prickles (modified common petiole); leaves bipinnate, pinnae 2–4, the rhachis elongated, phyllode-like, flattened, spine-pointed, with numerous very small obovate leaflets along the margin; flowers in small axillary racemes; pedicels up to 1·3 cm. long, slender, glabrous; petals 5, spreading; stamens 10, free, filaments pilose in the lower part; fruit linear, torulose, up to 13 cm. long, beaked, striate, glabrous .. .. *aculeata*

P. aculeata *Linn.*—F.T.A. 2 : 267; Holl. 2 : 253; Chev. Bot. 221. An exotic shrub or small tree, 10–15 ft. high, with fairly conspicuous yellow flowers; planted in native towns throughout the Sudan and elsewhere in dry localities; native of tropical America. (See Appendix).

36. BURKEA Hook.—F.T.A. 2 : 319.

A tree; young parts reddish-tomentose; leaves bipinnate, 2–5-jugate, jugae opposite; leaflets alternate, up to about 12, ovate to ovate-lanceolate, obtuse or emarginate at the apex, unequal-sided at the base, up to 5 cm. long and 3·5 cm. broad, at first silky, at length glabrous and more or less glaucous below; flowers in panicles of slender spikes up to 30 cm. long; axis pubescent; calyx 1·5 mm. long, lobes ciliate; petals about twice as long as the calyx, glabrous; stamens 10; ovary densely villous; fruits flat and thin, elliptic-lanceolate, long-stipitate, about 6 cm. long, 2·3 cm. broad, shortly appressed-pubescent .. .. *africana*

B. africana *Hook.*—F.T.A. 2 : 320; Holl. 2 : 278; Chev. Bot. 236. A deciduous tree attaining 50–70 ft. in height, with stout knotted branchlets, blackish corrugated bark, light silky foliage, and pendulous spikes of small creamy fragrant flowers crowded with the leaves at the ends of the branchlets.

All over tropical Africa, extending to Transvaal; chiefly in savannah forests. Exsicc.—*Barter* 1134. *Rowland. Elliott* 208. *Dalz.* 15; 73. *Pobéguin* 871. *Kersting* A 308. (See Appendix).

37. ERYTHROPHLEUM Afz.—F.T.A. 2 : 320.

Leaflets acuminate:

Lateral nerves of leaflets numerous (10 or more pairs), close, slender, and parallel; midrib of leaflets usually pubescent below; leaflets alternate, ovate-elliptic, obtusely acuminate, 5–9 cm. long, 3–5 cm. broad, drying green; racemes in lax panicles; branchlets of inflorescence slender and catkin-like; fruits up to 13 cm. long and 4 cm. broad, flat, glabrous, woody-leathery, 5–10-seeded 1. *guineense*

Lateral nerves few (5–7 pairs); midrib of leaflets glabrous; leaflets usually drying blackish, otherwise as above; branchlets of inflorescence stiff and spike-like 2. *micranthum*

Leaflets rounded or emarginate at the apex, more or less obliquely oblong, unequal-sided at the base, 3–4 cm. long, 1·3–2 cm. broad, softly pubescent when young; branchlets of inflorescence catkin-like, pubescent; fruits oblong, acute, up to 12 cm. long and 2·5 cm. broad, few-seeded, glabrous .. .. .. 3. *africanum*

1. **E. guineense** *G. Don*—F.T.A. 2 : 320; Holl. 2 : 278; Chev. Bot. 236. *Fillaea suaveolens* Guill. & Perr. Tent. Fl. Seneg. 1 : 242, t. 55. A large tree, with spreading crown, reaching 100 ft., and 10 ft. girth; pods opening without scattering the seeds; flowers small, creamy or reddish, very fragrant, crowded in spike-like racemes.
Throughout the area in mixed deciduous and fringing forests; extending to Upper Nile Land, Uganda and East Africa. Exsicc.—*Heudelot* 199. *Sc. Elliot* 5063. *Farmar* 281; 338. *Elliott* 92. *Unwin* 22. *Pobéguin* 692. *Buettner* 700. *Baumann* 380. (See Appendix).
2. **E. micranthum** *Harms* ex *Holland* in Kew Bull. Add. Ser. 9 : 279 (1911); Chev. Bot. 237. *E. ivorense* A. Chev. l.c. 236. A tree like the preceding.
Ivory Coast: Bingerville, at edge of lagoon (fr. Feb.)! Azaguié, by the railway! Cavally Basin, between Taté and Tabou. Gold Coast: Western Prov., Axim and district, Dunkwa Tarkwa! S. Nigeria: Nun R. (Sept.)! Brass! Also in French Cameroons and Gabon. Exsicc.—*Mann* 482. *Chipp* 165; 259; 293. *Vigne* 913; 923. *King-Church* 16. *Chev.* 16220; 22290. (See Appendix).
3. **E. africanum** *Harms* in Fedde Repert. 12 : 298. *Gleditschia africana* Welw.—F.T.A. 2 : 265; Chev. Bot. 221. *Caesalpinioides africanum* O. Ktze. *Erythrophloeum pubistamineum* P. Hennings. A fair-sized tree with spreading crown, the young parts softly tomentose, and foliage very like that of *Burkea africana*.
French Guinea: locality? Togo: Tamberma, stony dry savannah (fr. Jan.)! Kabure. Dahomey: Atacora Mts., 1,500–2,000 ft.! Extends to East Africa and S.W. Africa. Exsicc.—*Chev.* 24163. *Kersting* 4; 384. (See Appendix).

81. MIMOSACEAE.

Trees or shrubs, very rarely herbs. Leaves mostly bipinnate, rarely simply pinnate, often with large glands on the rhachis. Flowers hermaphrodite, small, spicate, racemose or capitate, actinomorphic, usually 5-merous. Calyx tubular, valvate or very rarely imbricate, 5-lobed or toothed. Petals valvate, free or connate into a short tube. Stamens equal in number to the sepals or more numerous, free or monadelphous; anthers small, 2-celled, opening lengthwise, often with a deciduous gland at the apex. Ovary superior, of 1 carpel. Fruit mostly dehiscent. Seeds with scanty or no endosperm.

Mainly tropics and subtropics, often in dry regions and then frequently spiny; easily recognised by the usually bipinnate leaves and small flowers with valvate petals.

Calyx-lobes imbricate :
Flowers bisexual in elongated paniculate spikes; stamens 5; staminodes several; fruit elongated, with the valves recurved when mature .. 1. **Pentaclethra**
Flowers in dense short more or less club-shaped heads, the upper ones bisexual, the lower staminate or neuter; stamens 10; no staminodes; fruits 2-valved 2. **Parkia**
Calyx-lobes valvate :
Filaments free or united only with the disk at the base, flowers spicate or capitate.
Stamens definite, as many as or up to twice as many as the petals :
Flowers in spikes or racemes; anthers tipped by a small deciduous gland :
All the flowers bisexual or if some neuter then flowers capitate :
Fruits dehiscent, not breaking into 1-seeded segments :
Flowers sessile on the axis :
Leaflets several to each pinna :
Fruit sickle-shaped, very cuneate at the base, the valves very hard and elastic .. .. 3. **Calpocalyx**
Fruit with thin not elastic valves, rounded at each end, very broad 4. **Fillaeopsis**
Leaflets 2 to each pinna; pinnae 1 pair .. .. .. 5. **Newtonia**
Flowers pedicellate on the axis, the pedicels articulating at the top and persisting as "pegs" :
Disk absent or consolidated with the filaments; seeds winged or not, attached in the middle .. .. 6. **Piptadenia**
Disk conspicuous, surrounding the base of the gynophore; seeds winged, attached near the end .. .. 7. **Cylicodiscus**
Fruits dehiscent, flat, breaking up into 1-seeded segments and leaving the continuous persistent sutures .. .. 8. **Entada**
Fruits indehiscent, more or less turgid :
Fruit subterete, not winged .. .. 9. **Prosopis**
Fruit tetragonal, not winged .. .. 10. **Amblygonocarpus**
Fruit with a wing-like ridge along the back of each valve .. 11. **Tetrapleura**
Upper flowers of the spikes bisexual, the lower neuter; fruits twisted and crowded; branches armed with axillary spines; pinnae about 10 pairs, leaflets small and numerous .. .. 12. **Dichrostachys**

Flowers capitate :
Trees, shrubs or rarely herbs, not aquatic :
Anthers tipped by a deciduous apical gland ; valves of fruit woody and strongly elastic ; large tree ; pinnae 1 pair .. .. 13. **Xylia**
Anthers without an apical gland ; fruit not woody :
Tree with smooth branchlets ; pinnae about 5 pairs ; fruits linear, flat, not prickly .. .. 14. **Leucaena**
Slender trailer with quadrangular stems covered with numerous recurved prickles ; pinnae 2–3 pairs ; fruits linear, 4-ridged, prickly .. 15. **Schrankia**
Shrubs or herbs ; stems terete ; pinnae several pairs ; fruits flat, prickly or setose .. .. 16. **Mimosa**
Aquatic herbs with some of the leaves submerged ; leaves sensitive ; pinnae 2–3 pairs ; flowers capitate, on elongated peduncles, the upper ones bisexual, the lower neuter ; anthers with a deciduous apical gland ; fruit flat, glabrous 17. **Neptunia**
Stamens more than twice as many as the petals ; flowers in spikes or heads ; branchlets often armed with stipular spines or prickles .. .. .. 18. **Acacia**
Filaments united into a short or long tube ; flowers capitate :
Valves of fruit not separating elastically ; stipules inconspicuous :
Fruit not jointed, flat .. .. 19. **Albizzia**
Fruit jointed and circinate or thick and straight and indented between the seeds 20. **Cathormion**
Valves of fruit separating elastically from the top downwards ; stipules persistent, nervose .. .. 21. **Calliandra**

Samanea Saman Merrill (*Pithecolobium Saman* Benth.), an American species, is grown in some gardens and as a shade tree. We have seen specimens from the Gold Coast and Dahomey. It has 2–6 pairs of fairly large leaflets shortly pubescent below, and tomentose calyx and corolla ; fruits straight, black when dry.

1. PENTACLETHRA Benth.—F.T.A. 2 : 322 ; Benth. in Trans. Linn. Soc. 30 : 360 (1875).

A tree up to 70 ft. high ; young parts rusty-tomentellous ; leaves bipinnate ; pinnae opposite, in about 10 pairs ; rhachis angular, scurfy-puberulous ; leaflets about 12 pairs, opposite, obliquely oblong, truncate and unequal-sided at the base, emarginate and shortly mucronate at the apex, about 2·5 cm. long and 1 cm. broad, glabrous or nearly so ; spikes paniculate, elongated ; calyx very short : petals about 2 mm. long ; stamens 5, with alternating staminodes ; fruit elongated, 8–10 cm. broad, valves thick and woody, at length recurved ; seeds flattish, varying from oblanceolate to subrhomboid, striate, up to 6–7 cm. long .. .. .. *macrophylla*

P. macrophylla *Benth.*—F.T.A. 2 : 322 ; Benth. l.c. 360 ; Holl. 2 : 280 ; Chev. Bot. 237. A large tree 40–70 ft. high ; flowers yellowish-creamy, fragrant ; pods strongly elastic.
In forests and river fringes from Senegal to Cameroons and Fernando Po. Extends southwards to Congo and Northern Angola. Exsicc.—*Heudelot* 825. *T. Vogel* 232. *Mann* 2203. *Cummins* 219. *Thompson* 27. *Talb.* 3113. *Dalz.* 8064. (See Appendix).

2. PARKIA R. Br.—F.T.A. 2 : 323.

Leaflets over 1·5 cm. long and about 0·5 cm. broad, alternate or opposite, about 20–30 pairs, oblong, auriculate on one side at the base, minutely ciliolate ; rhachis thinly pubescent ; peduncles up to about 30 cm. long, glabrous ; heads cylindric at the base and then globose, about 5 cm. diam. ; fruits stipitate, about 25 cm. long, 2·5 cm. broad .. .. 1. *filicoidea*
Leaflets up to 1 cm. long, scarcely more than 2·5–3 mm. broad :
Rhachis of leaves shortly greyish-pubescent ; leaflets opposite, linear, auriculate-toothed on the lower side at the base, shortly ciliate on the margin ; peduncles up to 20 cm. long, rather slender ; heads shortly cylindric at the base, upper part globose, about 4 cm. diam. ; calyx-lobes golden-tomentellous outside ; fruit linear, shortly stipitate, about 20 cm. long and 2 cm. broad .. .. .. 2. *biglobosa*
Rhachis of leaves densely rusty-tomentellous ; other characters as in preceding species, but peduncle much shorter, up to 12 cm. long .. .. 3. *bicolor*

1. **Parkia filicoidea** *Welw.*—F.T.A. 2 : 324 ; Holl. 2 : 281 ; Chev. Bot. 238. *P. africana* R. Br.—Chev. Bot. 237. A tree of savannah and deciduous forests, reaching about 60 ft. in height, with spreading branches and scarlet flowers in spherical balls hanging from long peduncles.
French Sudan : Gourma. Gold Coast : Kwahu (Jan.) ! Dahomey : Kétou. N. Nigeria : common (Jan.) ! S. Nigeria : Lagos ! Olokemeji ! Abeokuta. All over tropical Africa. Exsicc.—*Barter* 1136. *Johnson* 578. *Elliott* 54. (See Appendix).
2. **P. biglobosa** *Benth.*—F.T.A. 2 : 324 ; Holl. 2 : 281 ; Chev. Bot. 238. A large spreading tree with dark foliage ; flower-balls red, sometimes yellow.
French Sudan : Siguiri (Jan., Feb.) ! Dieudénia ; San ; Wahigoua. Senegal : Kaolak ; Casamance. Gambia and Sierra Leone : a common tree, flowering in Dec. and later, fruiting from March. Ivory Coast : Nzi. Also found in tropical America. Exsicc.—*Perrottet* 261, *Barter* (no number). *Sc. Elliot* 3857 ; 4771. *Dawe* 14. (See Appendix).

3. **P. bicolor** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8 : 34 ; Bot. 238. *P. agboensis* A. Chev. Bot. 237. *P. Zenkeri* Harms. A tree.
French Guinea : Kindia and neighbourhood (Mar.-May) ! Sierra Leone : ? locality ! Ivory Coast : Bingerville ; Makougnié ; on the Agniéby River at Agbo Bridge ; Dabou ; Azaguié village. Gold Coast : Axim, etc., common in forests of the south-west (Nov.-Jan.) ! Dahomey : Niaouli, near Allada, in a patch of high forest ! S. Nigeria : Yaba ! Degema ! Oban ! Eket ! Extends southwards to Gabon. Exsicc.—*Sc. Elliot* (no number). *Millen* 72. *Chipp* 23 ; 27. *Thomas* 966. *Unwin* 27. *Talb.* 1350 ; 1467 ; 3047 ; 3060–1 ; 3694. *Chev.* 16012 ; 16154 ; 16925 ; 16981 ; 20154 ; 22292 ; 23422. (See Appendix).

3. CALPOCALYX Harms in Engl. & Prantl, Nat. Pflanzenf. Nachtr. 1 : 191, and in Engl. Bot. Jahrb. 26 : 257 (1899).

Leaves glabrous below :

Bracts nearly as long as the flowers, persistent, thickened in the middle and tapered to a point ; spikes about 2·5 cm. long, pedunculate ; calyx and petals tomentellous outside ; leaflets opposite, oblong-elliptic, abruptly acuminate, unequal-sided and rounded at the base, 6–12 cm. long, 3–7 cm. broad, glabrous and reticulate on both surfaces ; petiolules about 0·5 cm. long .. .. 1. *Dinklagei*

Bracts minute and inconspicuous ; spikes as above but more elongated and more shortly pedunculate ; leaflets opposite, oblong or oblong-elliptic, very long-acuminate, acumen with a very sharp tip ; fruits sickle-shaped, tapered to the base, about 15 cm. long or more and 3 cm. broad, curling up when ripe 2. *brevibracteatus*

Leaves closely tomentellous below ; pinnae 1–2 pairs ; leaflets 3–5 pairs, oblong-lanceolate to obovate-oblanceolate, acute or acuminate, mucronate, rounded at the base, 3–7 cm. long, 1·5–3 cm. broad, with about 5 pairs of lateral nerves ; panicles elongated-tomentellous ; bracts subulate, persistent ; calyx and corolla tomentose ; young fruit stipitate, nearly glabrous, falcate .. .. 3. *sericeus*

1. **C. Dinklagei** *Harms* ll.cc. *Erythrophloeum Dinklagei* Taub. A tree 30–50 ft. high, with 1-jugate bipinnate leaves ; flowers very small, white or yellowish, in pedunculate spikes forming a panicle.
S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Talb.* 1641. (See Appendix).

2. **C. brevibracteatus** *Harms* in Bull. Soc Bot. Fr. 53 : 155 ; Chev. Bot. 241. *C. macrostachys* Harms. A medium-sized forest tree.
Sierra Leone : Gola Forest (fr. Jan.) ! Kambui ! Kennema ! Liberia : Gbanga (Sept.) ! Peahtah (Oct.) ! Ivory Coast : Yapo (Oct.) ! Gold Coast : Tano Rapids (Sept.) ! Near Kankan ! Poposo, east of Tarkwa (fr. May) ! Abosso (Aug.) ! S. Nigeria : Tiko (fr. Jan.) ! Exsicc.—*Johnson* 923. *Thompson* 91. *Unwin & Smythe* 68. *Lane-Poole* 459. *Aylmer* 253. *Chipp* 224 ; 371. *Dunlap* 174. *Vigne* 146. *Linder* 471 ; 667 ; 1050. (See Appendix).

3. **C. sericeus** *Hutch. & J. M. Dalz.* in Kew Bull 1928, ined. A strong woody climber with hexagonal branches and yellowish-grey foliage ; flowers fragrant.
Liberia : Gbanga (Sept.) ! Peahtah (Oct.) ! Exsicc.—*Linder* 478 ; 478A.

4. FILLAEOPSIS Harms in Engl. Bot. Jahrb. 26 : 258 (1899).

A tree ; leaves bipinnate ; pinnae opposite, 1–2 pairs ; leaflets mostly alternate, 4–8 to each pinna, ovate-elliptic, rounded at the base, shortly obtusely acuminate, 4–7 cm. long, 2–3·5 cm. broad, glabrous ; spikes rather densely paniculate at the end of the shoots ; flowers very numerous, crowded ; calyx small, 5-toothed, teeth ovate, obtuse, glabrous ; petals 5, free, ovate, acute, valvate, glabrous ; stamens 10 ; anthers glandular at the apex ; disk large, surrounding the ovary ; fruit very large, oblong, up to 40 cm. long and 15 cm. broad, shining, rather faintly nervose ; seeds transverse, oblong, about 7 cm. long and 3 cm. broad, winged, attached by the middle to a slender funicle .. .. *discophora*

F. discophora *Harms* l.c. 259. t. 6. A tree 30–50 ft. high, " strongly branched and with an offensive odour."
S. Nigeria : Ikom, Boji Hills (fr. June) ! Also in French Cameroons, Gabon and probably Angola. Exsicc. —*Unwin* 24. (See Appendix).

5. NEWTONIA Baill. in Bull. Soc. Linn. Par. 1 : 721 (1888).

A large tree ; branchlets puberulous ; leaves bipinnate ; pinnae 1 pair, opposite ; leaflets 1 pair, opposite, obovate, cuneate and unequal-sided at the base, very slightly and obtusely acuminate, 7–12 cm. long, 4–7 cm. broad, glabrous ; lateral nerves prominent, about 8 pairs ; spikes paniculate, up to 10 cm. long, shortly pubescent all over ; calyx cupular, denticulate, 1 mm. long ; corolla about twice as long as the calyx ; stamens 10 ; anthers with a deciduous gland ; fruit dehiscent, linear-oblong, flat, 15–20 cm. long, about 3·5 cm. broad, glabrous ; seeds flat and winged, 7–10 cm. long, 2–2·5 cm. broad, broadly winged, attached by a long slender funicle *insignis*

N. insignis *Baill.* l.c. A tree up to 80 ft. high, with smooth bark and well-developed root flanges, and very large thinly leathery pods.
Sierra Leone : Kambui Reserve (Apr.) ! Gold Coast : north of Chama (Apr.) ! east of Essuasu (May) ! Also in Gabon. Exsicc.—*Chipp* 205 ; 214. *Lane-Poole* 215.

6. PIPTADENIA Benth.—F.T.A. 2 : 328.

Leaflets very small and numerous, contiguous, about 5–6 mm. long and 1·5 mm. broad, linear-subfalcate, auriculate at the base ; pinnae about 15 pairs ; panicles of spikes brown-tomentose ; fruits broadly linear, elongated, about 30 cm. long and 3 cm. broad, obliquely nervose, glabrous ; seeds 6–8, flat, winged, attached in the middle, about 5 cm. long .. .. 1. *africana*

Leaflets much larger, about 1·5 cm. long and 5 mm. broad or more :
Petals pubescent outside :
Leaflets narrowly oblong, equally broad at each end, rounded-auriculate at the base, nervose ; pinnae 6–8 pairs ; leaflets 20–30 pairs ; racemes slender and catkin-like, up to 20 cm. long, shortly pubescent ; pedicels short ; calyx and petals tomentellous .. .. 2. *Kerstingii*
Leaflets obovate, rather narrowed to the base, 3–4 pairs, 3–4·5 cm. long, 2–2·5 cm. broad, with numerous looped lateral nerves ; pinnae 1 pair ; fruits somewhat curved, smooth, flat, 7–8 cm. long, 2 cm. broad, glabrous ; seeds 4–6, flat, 5–7 mm. long .. .. 3. *Elliotii*
Petals glabrous outside :
Leaflets rather numerous, about 12 pairs, oblong, oblique at the base, rounded at the apex, about 1·5 cm. long and 6–8 mm. broad, minutely pubescent below ; pinnae about 4 pairs ; panicles slender, lax .. .. 4. *Mannii*
Leaflets few, about 3 pairs, elliptic, about 5 cm. long and 2·5 cm. broad, obscurely nervose, glabrous ; racemes crowded in a panicle, nearly glabrous 5. *Chevalieri*

1. **Piptadenia africana** *Hook. f.*—F.T.A. 2 : 328 ; Holl. 2 : 283 ; Chev. Bot. 240. A very common tree of evergreen and mixed forests, reaching 120 ft. in height and 12 ft. or more in girth, with straight bole buttressed at the base, spreading parasol-like branches, fine fern-like foliage ; flowers in panicled yellowish-white spikes.
From Senegal to Cameroons, north to Nupe, in N. Nigeria ; extending to E. Sudan, Congo and Angola. Exsicc.—*T. Vogel. Ansell. Millen* 190. *Johnson* 690. *Thomas* 971. *Chipp* 249. *Aylmer* 249. (See Appendix).
2. **P. Kerstingii** *Harms* in Engl. Bot. Jahrb. 40 16. A tall forest tree, 40–60 ft. high, buttressed at the base flowering Jan.–Mar., fruit in Apr.
Togo : Sokode-Basari ! N. Nigeria : Agaie (Feb.) ! Also in French Cameroons (Yaunde). Exsicc.—*Kersting* A 5 ; A 294 ; A 511. *Yates* 12. (See Appendix).
3. **P. Elliotii** *Harms* in Engl. Bot. Jahrb. 26 : 260. A tree ?
Sierra Leone : ? locality ! Exsicc.—*Sc. Elliot* 4792.
4. **P. Mannii** *Oliv.*—F.T.A. 2 : 329. A shrub 15 ft. high.
S. Nigeria : Aguku ! Fernando Po (June) ! Exsicc.—*Mann* 414. *Thomas* 842.
5. **P. Chevalieri** *Harms* in Journ. de Bot. 22 : 112 ; Chev. Bot. 240. *Erythrophloeum purpurascens* A. Chev. A tree or shrub (?), with small black-purple flowers.
Ivory Coast : Aboisso (Sanvi, Apr.) ! Exsicc.—*Chev.* 16303 bis.

7. CYLICODISCUS Harms in Engl. & Prantl, Nat. Pflanzenf. Nachtr. 1 : 192, and in Engl. Bot. Jahrb. 26 : 256 (1899).

A large tree ; leaves bipinnate ; pinnae opposite, 1 pair ; leaflets alternate, stalked, ovate, rather long-acuminate, 5–10 cm. long, 3–5 cm. broad, shining above, glabrous and finely reticulate ; primary rhachis 2–2·5 cm. long, secondary up to 12 cm. long ; racemes spike-like, usually paired or several, slender, up to 15 cm. long ; axis shortly pubescent ; pedicels about 1 mm. long, persistent ; calyx nearly 1 mm. long ; petals glabrous, 2 mm. long ; stamens 10, free ; anthers with a small deciduous apical gland ; ovary stipitate ; ovules several ; fruit (young) elongated, covered with rusty scales ; seeds attached near the end .. .. *gabunensis*

C. gabunensis *Harms* ll.cc. ; Holl. 2 : 283. *Erythrophloeum gabunense* Taub. *Cynloriphus Staudtii* Harms. *Piptadenia* sp. Thompson Rep. Forests Gold Coast 1910 : t. 17. A very large tree of evergreen forests, reaching 200 ft. in height and 30 ft. in girth, with straight bole up to 80 ft. and short buttresses ; armed with brown thorns in the sapling stage ; flower-spikes yellow ; pods up to 3 ft. long, 1½ in. broad ; seeds flat, thinly winged, sometimes over 3 in. broad.
Sierra Leone ! Gold Coast : abundant in the forests of the Western Province and of Ashanti ! S. Nigeria : in forests from Abeokuta to Cameroons ! extending to Gabon. Exsicc.—*Thompson* 27. *Vigne* 891. *Unwin. Sankey* 22. *Staudt* 766. (See Appendix).

8. ENTADA Adans.—F.T.A. 2 : 325 ; Benth. in Trans. Linn. Soc. 30 : 363 (1875).

Branchlets not prickly :
Leaflets in very few pairs, obliquely elliptic, emarginate, 2·5–7 cm. long, glabrous, pinnae 3 pairs, the end pair usually tendriliform ; inflorescence very slender, up to 30 cm. long ; flowers subsessile or shortly pedicellate ; calyx ½ as long as the petals in bud, cupular, ribbed, pubescent or glabrous ; fruits very large, woody, up to 120 cm. long, 8–10 cm. broad .. .. 1. *gigas*
Leaflets in numerous pairs ; end pair of pinnae not tendriliform :
Trees or erect shrubs ; pinnae several pairs :
Midrib in the middle or near the middle of the leaflets :
Leaflets oblong-elliptic, emarginate, 1–1·5 cm. long, minutely pubescent below ; racemes shorter than the leaves ; calyx and pedicels minutely pubescent ; fruit up to about 30 cm. or more long and 12 cm. broad .. .. 2. *africana*
Leaflets linear or oblong-linear, slightly emarginate, glabrous below, 2–3·5 cm. long, glaucous-green ; racemes glabrous, up to 15 cm. long ; fruit elongated, with very wavy margins, about 5 cm. long .. .. 3. *sudanica*
Midrib near one margin of the leaflets, the latter linear, mucronate, 6–8 mm. long, minutely pubescent below ; racemes very slender, 2–3 together, up to 12 cm. long, glabrous or nearly so ; fruit up to 35 cm. long (or more ?) and 9 cm. broad, slightly undulate on the margin .. .. 4. *abyssinica*

Climber with 2 pairs of pinnae ; leaflets linear, with the midrib towards one side at the base, about 1·5 cm. long and 2·5 mm. broad, glabrous ; branchlets very zigzag ; racemes about 6 cm. long, glabrous ; fruits sickle-shaped, about 20 cm. long and 3·5 cm. broad, breaking up into rather narrow segments .. .. 5. *flexuosa*

Branchlets and leaf rhachis rather densely armed with short recurved prickles ; pinnae 6–10 pairs ; leaflets 10–12 pairs, oblong, rounded at the apex, 1–1·5 cm. long, 4–7 mm. broad, minutely pubescent ; spikes 4–6 cm. long, solitary or up to 3 together ; flowers yellowish-white, glabrous ; ovary pubescent, long-stipitate ; fruits about 25–30 cm. long and 7 cm. broad .. .. 6. *sclerata*

1. **E. gigas** *Fawcett & Rendle*, Fl. Jamaica 4 : 124. *Mimosa gigas* Linn. *Entada scandens* Benth.—F.T.A. 2 : 325 ; Benth. l.c. 363 ; Holl. 2 : 282 ; Chev. Bot. 239. A lofty woody climber with very stout stem and enormous woody segmented pods.

Senegal ! Sierra Leone : Limba, near Kafogo (Apr.) ! Erimakuna ! Ivory Coast : Pays des Abés, Bouroubourra ; Lower Cavally, between Prolo and Blérion. Togo ! S. Nigeria : near Aponu ! Common in the forest and in fringing forests in N. Nigeria. Fernando Po ! Widely spread in tropical Africa and America..

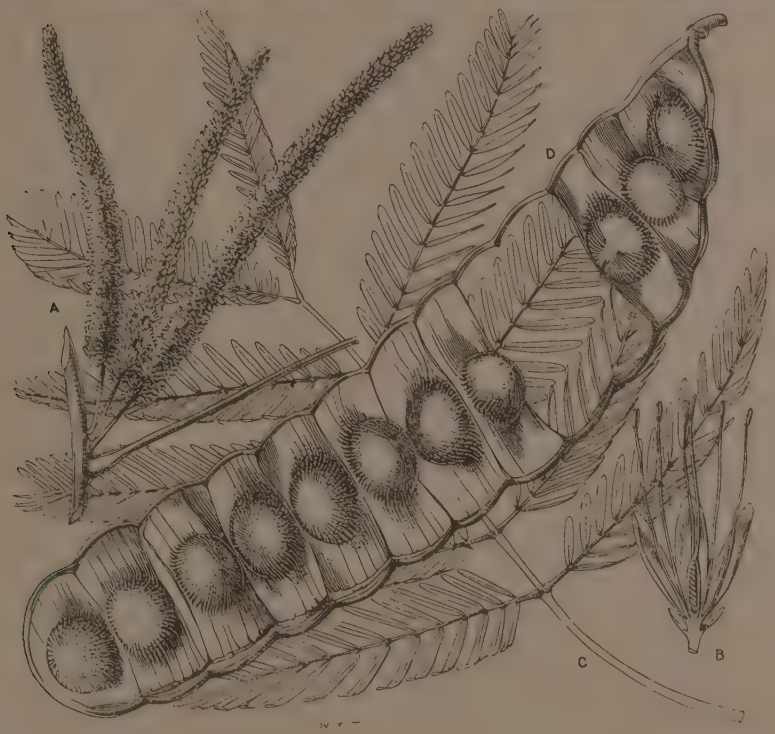

FIG. 136.—ENTADA SUDANICA *Schweinf.* (MIMOSACEAE).

A, inflorescence. B, longitudinal section of flower. C, leaf. D, fruit.

Exsicc.—*Heudelot* 890. *Mann* 230 ; 1438. *Sc. Elliot* 5227 ; 5520. *Lane-Poole* 225. *Foster* 211. *Baumann* 502. (See Appendix).

2. **E. africana** *Guill. & Perr.*—F.T.A. 2 : 326 ; Benth. l.c. 364 ; Chev. Bot. 239. A tree 20–30 or more feet high.

Senegal ! Gambia ! Dahomey : Atacora Mts., Kouandé. S. Nigeria : Onitsha ! Lagos Colony ! Fernando Po (fr. Dec.) ! Exsicc.—*Perrottet* 290. *Barter* 1801. *Mann* 20. *Brown-Lester*. *Moloney*. *MacGregor* 199.

3. **E. sudanica** *Schweinf.*—F.T.A. 2 : 327 ; Benth. l.c. 364 ; Holl. 2 : 282 ; Chev. Bot. 239. A small tree usually about 20 ft. high, with creamy white flower-spikes ; very common in savannah country from French Sudan and Gambia to N. Nigeria ; extending to the Red Sea provinces, south to Zambesi and through Cameroons to Congo. Exsicc.—*Barter* 1056 ; 1122. *Ozanne* 20. *MacGregor* 244. *McLeod* 820. *Dalz.* 607. (See Appendix).

4. **E. abyssinica** *Steud.*—F.T.A. 2 : 327 ; Benth. l.c. 364 ; Chev. Bot. 238. A small tree of the savannahs, 20–30 ft. high, with yellowish-white flower-spikes.

French Sudan : Toukoro (May). French Guinea and Sierra Leone : Falaba to Farana (Mar.) ! common on the plateaux around the upper streams of the Niger. Gold Coast : Wanki (fr. June) ! Ashanti, Central Province (fr. Nov., Dec.) ! Kwahu ! Bole, Northern Territory (Apr.) ! Togo : Kpedsu (fr. Dec.) ! N. Nigeria : between Abinsi and Katsina Allah (June) ! S. Nigeria : Ishoka, Benin (fr. Oct.) ! Extends to

Red Sea Provinces, East Africa and Rhodesia. Exsicc.—*Sc. Elliot* 5307. *Chipp* 777; 780. *McLeod* 844. *Howes* 1058. *Dalz.* 605. *Unwin* 156. *Kersting* 49. (See Appendix).

5. **E. flexuosa** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, incd. *E. Wahlbergii* Oliv.—F.T.A. 326, not of Harv.; Chev. Bot. 239. A liane with slender woody stems climbing to a considerable height; flowers brown-purple.
French Sudan: Bama, in bush at the foot of termite hills. Ivory Coast: Middle Comoé, between Akabossué and Ebrinahoué. N. Nigeria: Nupe! Yola (July)! Also in Jurland and Uganda. Exsicc.—*Barter* 991. *Dalz.* 7. *Chev.* 943; 22612.

6. **E. sclerata** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8d : 160; Chev. Bot. 239. A spiny woody climber.
Ivory Coast: Morénou! Middle Sassandra. S. Nigeria: Idumuje (Jan.)! Exsicc.—*Chev.* 22428. *Thomas* 2155.

9. PROSOPIS Linn.—F.T.A. 2 : 331; Bénth. in Trans. Linn. Soc. 30 : 376 (1875).

A tree with very hard wood; leaves bipinnate; pinnae 2–4 pairs, opposite, with a fleshy pore-like gland between the base of each pair; leaflets 6–12 pairs, opposite,

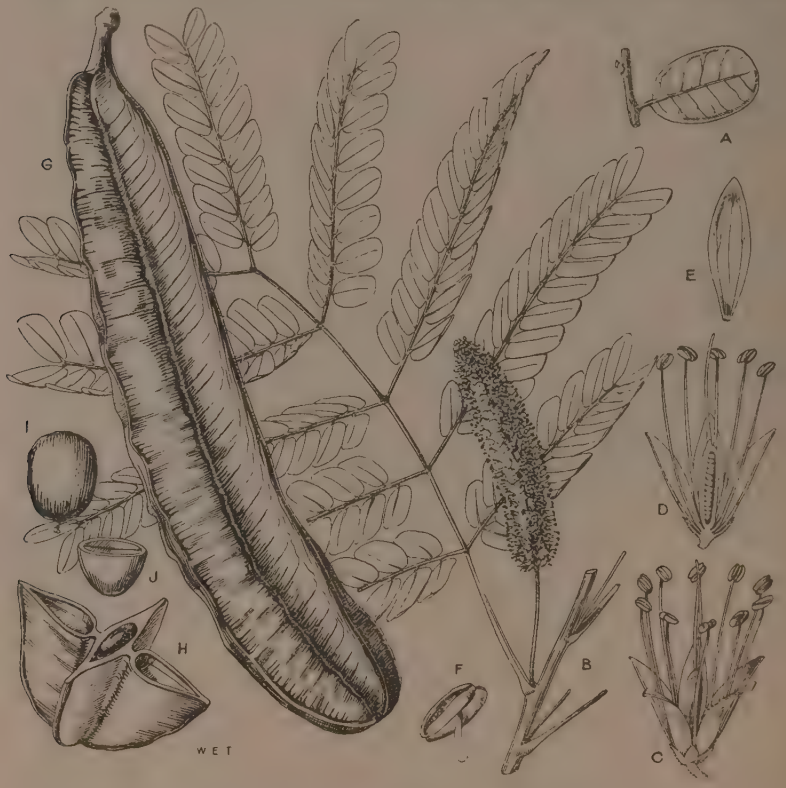

FIG. 137.—TETRAPLEURA TETRAPTERA *Taub.* (MIMOSACEAE).

A, leaflet. B, portion of stem with leaf and inflorescence. C, flower. D, longitudinal section of flower. E, petal. F, anther. G, fruit. H, cross section of fruit. I, seed. J, cross section of seed.

lanceolate or oblong-lanceolate, mucronate, 1·5–2 cm. long, 5–8 mm. broad, minutely pubescent on both surfaces; spikes axillary, solitary, shortly pedunculate, 4–6 cm. long; calyx slightly pubescent; petals glabrous; stamens 10, free; anthers with a small apical gland; ovary villous; fruit about 15 cm. long, 2·5 cm. thick, subturgid, black and shining, with a thick pericarp, thinly septate between the seeds; seeds ellipsoid, 1 cm. long, shining, with a thin intramarginal line all round *africana*

P. africana *Taub.* in Engl. & Prantl, Pflanzenfam. 3, 3 : 119. *P. oblonga* Benth.—F.T.A. 2 : 331; Benth. l.c. 377; Chev. Bot. 241. *Coulteria africana* Guill. & Perr. A tree 40 to 60 or more feet high, with foliage not unlike that of the tamarind but pale and drooping; flower-spikes yellowish, fragrant; pods stout, roughly cylindrical, brown-purple, with loose rattling seeds.
Common in open savannah and in deciduous forests, from Senegal to Nigeria! extending to the Eastern Sudan and Uganda. Exsicc.—*Heudelot* 14. *Barter* 1193. *Poéguin* 591. (See Appendix).

10. AMBLYGONOCARPUS Harms in Engl. & Prantl, Nat. Pflanzenf. Nachtr. 1 : 191, and in Engl. Bot. Jahrb. 26 : 255.

A tree ; leaves bipinnate ; pinnae 2–4 pairs, opposite or subopposite, without glands between ; leaflets alternate, broadly obovate-elliptic, truncate or slightly emarginate at the apex, 1·5–2·5 cm. long, 1–1·5 cm. broad, glabrous and glaucous ; racemes usually paired, shortly pedunculate, about 7 cm. long ; pedicels 3 mm. long, glabrous ; calyx very short, 5-toothed ; petals glabrous, 3·5 mm. long ; stamens 10 ; anthers with a small deciduous gland at the apex ; ovary glabrous ; fruit about 15 cm. long, tetragonal, about 2 cm. broad, with a woody shining pericarp *Schweinfurthii*

A. Schweinfurthii *Harms* ll.cc. ; Lely, Usef. Trees of N. Nig. p. 15. A tree with graceful pale foliage, 30–40 ft. high in savannah forests, up to 60 ft. in moister places, with dense spike-like racemes of yellowish flowers.
N. Nigeria : Sokoto Province, fairly common (Apr.–June) ! extending through French Cameroons to Eastern Sudan. Exsicc.—*Dalz.* 333 ; 537. *Lely* 4/21 ; 833. (See Appendix).

11. TETRAPLEURA Benth.—F.T.A. 2 : 330 ; Benth. in Trans. Linn. Soc. 30 : 375 (1875).

A tree ; young parts puberulous ; leaves bipinnate ; pinnae 6–8 pairs, opposite ; leaflets about 6–12 pairs, alternate, oblong-elliptic, rounded at each end, sometimes slightly emarginate, 1–2 cm. long, 0·5–1 cm. broad, minutely puberulous below ; racemes solitary or paired, axillary, pedunculate, 5–7 cm. long ; pedicels 2 mm. long, puberulous ; calyx less than 1 mm. long, 5-lobed ; petals lanceolate, 2·5 mm. long, glabrous ; stamens 10 ; anthers with an apical gland ; fruits 15 cm. long or more, each valve with a longitudinal wing-like ridge about 2 cm. broad, shining and transversely nerved, glabrous .. .. *tetraptera*

T. tetraptera *Taub.* in Bot. Centralbl. 47 : 395. *T. Thonningii* Benth.—F.T.A. 2 : 330 ; Benth. l.c. 375 ; Chev. Bot. 241. *Adenanthera tetraptera* Schum. & Thonn. A medium-sized tree, up to 70 ft. high, with dark green fern-like foliage, yellow or pinkish flower-spikes, and brown-purple 4-winged pods.
In mixed and fringing forests from Senegal to Cameroons, and extending to the Congo and St. Thomas Island. Exsicc.—*Sc. Elliot* 4779 ; 5209, partly ; 5534a. *Johnson* 1084. *Chipp* 244. *Yates* 10. *Punch* 143. *Unwin* 30 ; 71. *Dalz.* 1223. *Dunlap* 260. (See Appendix).

12. DICHROSTACHYS [1] DC.—F.T.A. 2 ; 332 ; Benth. in Trans. Linn. Soc. 30 : 381 (1875).

A shrub or small tree with axillary spines ; leaves bipinnate ; pinnae about 10 pairs, opposite, with a long rod-like gland between each ; leaflets numerous, rather variable in size, linear-oblong, up to 8 mm. long and 2·5 mm. broad, slightly pubescent ; rhachis pubescent ; spikes usually about 6–8 cm. long, pedunculate, the upper bisexual flowers yellow, the lower neuter ones pink or mauve ; fruits crowded in a head, undulate or much curved, glabrous, shining .. .. .. *glomerata*

D. glomerata *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *D. nutans* Benth.—F.T.A. 2 : 333 ; Benth. l.c. ; Chev. Bot. 242. *D. platycarpa* Welw.—F.T.A. 2 : 333 ; Stapf 601. *D. arborea* N.E. Br. *D. Lugardae* N.E. Br. *Caillica dichrostachys* Guill. & Perr. *Caillica glomerata* Macbride. *Mimosa glomerata* Forsk.
A very common and characteristic shrub of savannah and scrub lands all over tropical Africa and parts of S. Africa. Exsicc.—*Roger* 149. *Heudelot* 338. *Sieber* 47. *Barter* 533. *Mann* 795. *Sc. Elliot* 4682 ; 4829. *Poëguin* 688. *Kersting* 100. (See Appendix).

13. XYLIA Benth. in Benth. & Hook. f. Gen. Pl. 1 : 594, and in Trans. Linn. Soc. 30 : 373 (1875).

A tree ; leaves bipinnate ; pinnae 1 pair, opposite, with a large fat gland at the base ; leaflets 13–16 pairs, opposite, oblong-lanceolate, acuminate, 3–7 cm. long, 1–2 cm. broad, glabrous above, tomentellous below, with distinct lateral nerves ; flowers in pedunculate axillary solitary or paired heads ; heads 2 cm. diam. ; peduncles 3–6 cm. long, tomentellous ; stamens 10 ; anthers with a deciduous apical gland ; ovary pilose ; fruit compressed, oblong, subfalcate, woody, very hard, up to 20 cm. long, 5 cm. broad ; seeds 4, obovate-elliptic, 2 cm. long, shining .. .. *Evansii*

X. Evansii *Hutch.* in Kew Bull. 1908 : 258 ; Chev. Bot. 240. A tall tree of evergreen and mixed forests, with yellow flower-heads and hard, slightly bent pods.
Sierra Leone : Kambui ! Ivory Coast : Agboville ! Between Malamalasso and Daboisué ; Indénié at Zaranou ; between the Middle Sassandra and Middle Cavally. Gold Coast : Tano River (Feb.) ! Tenewonan ! Tappa, W. Ashanti (Feb.) ! Dunkwa ! Exsicc.—*Evans* 18. *Thompson* 15. *Chipp* 390. *Vigne* 896. *Unwin & Smythe* 26. *Lane-Poole* 460. (See Appendix).

4. LEUCAENA Benth.—F.T.A. 2 : 337 ; Benth. in Trans. Linn. Soc. 30 : 442 (1875).

A small tree ; leaves bipinnate ; pinnae about 5 pairs, sometimes with a gland between the lowest pair ; leaflets about 12 pairs, opposite, lanceolate, slightly falcate, acute, about 1 cm. long and 3 mm. broad, slightly pubescent, the midrib not quite in the middle ; flowers white, in pedunculate globose heads about 2·5 cm. in diam. ; calyx

[1] According to International Rules, the valid name for this genus is *Caillica* Guill. & Perr. (1833), but, in anticipation that the better-known *Dichrostachys* DC. (1834) will be added to the list of *nomina conservanda*, we have retained it.

funnel-shaped, teeth pubescent outside ; petals minutely pubescent outside ; stamens 10 ; anthers without an apical gland ; fruits numerous in each head, stellately spreading, linear, flat, 15 cm. long or more, 1·5–2 cm. broad, glabrous, thin, with the numerous seeds slightly oblique to the margins .. .. *glauca*

L. glauca *Benth.*—F.T.A. 2 : 337 ; Benth. l.c. 443 ; Chev. Bot. 243.
A native of America, common in the warmer parts of both hemispheres ; mostly cultivated or half naturalised by roadsides, etc. Exsicc.—*Roger. T. Vogel* 79.

15. SCHRANKIA Willd.—F.T.A. 2 : 336 ; Benth. in Trans. Linn. Soc. 30 : 441 (1875).

A slender trailer with numerous recurved setiform prickles on the quadrangular stems ; leaves bipinnate, sensitive ; pinnae 2–3 pairs, opposite ; leaflets 10–20 pairs, broadly linear, mucronate, about 1 cm. long, glabrous ; flowers in shortly pedunculate axillary heads ; stamens 10, free ; anthers not glandular ; fruits several to each head, linear,

FIG. 138.—DICHROSTACHYS GLOMERATA *Hutch. & Dalz.* (MIMOSACEAE).

A, branch, showing inflorescence. B, neuter-flower from base of inflorescence. C, bisexual flower from upper part of inflorescence. D, anther. E, pistil. F, fruiting branch.

up to 13 cm. long, 4-ridged, pubescent and with numerous straight short prickles spreading at right angles .. .. *leptocarpa*

S. leptocarpa *DC.*—F.T.A. 2 : 336 ; Benth. l.c. ; Chev. Bot. 243. A straggling perennial herb resembling the Sensitive Plant (*Mimosa pudica*) but with continuous not jointed pods.
Gold Coast : Cape Coast ! Accra ! Dahomey : Kotonu, on the sand near the lagoon ! S. Nigeria : Abeokuta ! near Lagos ! Also in tropical America and East Indies. Exsicc.—*T. Vogel* 70. *Moloney. Millen* 88. *Rowland. Debeaux* 149. *Chev.* 22092.

16. MIMOSA Linn.—F.T.A. 2 : 335 ; Benth. in Trans. Linn. Soc. 30 : 388 (1875).

Pinnae crowded at the end of the leaf-rhachis ; leaflets sensitive, linear-oblong, about 1·5 cm. long, more or less bristly-hairy ; branchlets and petioles bristly-pilose, the former prickly here and there ; stipules large, persistent, strongly nerved ; peduncles up to 3 cm. long ; fruits densely clustered, about 2 cm. long, margined with stiff bristles, segments few .. .. 1. *pudica*

Pinnae arranged along the leaf-rhachis ; stipules small or deciduous ; branchlets and leaf-rhachis prickly and roughly hirsute ; leaflets small, linear, margined with bristly

hairs and thinly appressed-pubescent on both surfaces ; fruits densely bristly all over, 4–6 cm. long, segments narrow and numerous .. .. 2. *asperata*

1. **M. pudica** *Linn.*—F.T.A. 2 : 336 ; Benth. l.c. 397 ; Stapf 601 ; Holl. 2 : 287. A straggling prickly plant, the " Sensitive Plant " of tropical America, a common weed of the tropics.
Exsicc.—*Sc. Elliot* 4165. *Whyte* (no number).
2. **M. asperata** *Linn.*—F.T.A. 2 : 335 ; Benth. l.c. 437 ; Holl. 2 : 287 ; Chev. Bot. 243. A prickly shrub, with sensitive leaves and pale mauve flower-balls, forming dense thickets on river banks.
Common all over the tropics. Exsicc.—*Sieber. Döllinger. T. Vogel* 6 ; 15. *E. Vogel* 81. *Barter* 1175. *Mann* 2269. *Sc. Elliot* 5078. (See Appendix).

17. NEPTUNIA Lour.—F.T.A. 2 : 333 ; Benth. in Trans. Linn. Soc. 30 : 383 (1875).

Aquatic herbs with thickish stems rooting at the nodes ; leaves sensitive, bipinnate ; pinnae 2–3 pairs, opposite ; leaflets in 8 or more pairs, linear-oblong, rounded at the apex, about 1·5 cm. long, glabrous ; submerged leaves finely dissected ; stipules broadly ovate ; flowers capitate on elongated stout peduncles up to 20 cm. long, the upper bisexual, the lower neuter ; sepals and petals glabrous ; stamens 10 ; anthers with a deciduous apical gland ; fruit shortly stipitate, oblong, 2–2·5 cm. long, sharply beaked, flat, glabrous .. .. *prostrata*

N. prostrata *Baill.* in Bull. Soc. Linn. Par. 1 : 356. *Mimosa prostrata* Lam. *N. oleracea* Lour.—F.T.A. 2 : 334 ; Benth. l.c. ; Chev. Bot. 242.
French Sudan : Mopti, in inundations of the Niger (Sept.) ! Télé. Dahomey : Porto Novo Lagoon (fr. Jan.) ! S. Nigeria : near Lagos ! Widespread in tropical Africa, also in Madagascar, tropical Asia and America. Exsicc.—*Moloney. Chev.* 22784 ; 24964.

18. ACACIA Willd.—F.T.A. 2 : 337 ; Benth. in Trans. Linn. Soc. 30 : 444 (1875).

Flowers in spikes or racemes :
Pinnae in 2 pairs, each with only 1 pair of leaflets ; branches armed with pairs of curved stipular spines about 5 mm. long ; leaflets obovate, very unequal-sided at the base, about 1 cm. long and about 0·8 cm. broad, distinctly nervose, paler below ; spikes axillary, fasciculate, 3–4 cm. long ; petals about 3 times as long as the cupular calyx ; fruit flat, oblong, 4–6 cm. long, reticulate, glabrous ; seeds few, orbicular, about 1 cm. in diam. .. .. 1. *mellifera*
Pinnae in several to numerous pairs, each with several to numerous pairs of leaflets :
Prickles or spines only at the nodes of the branchlets (rarely altogether absent), stipular in origin :
Pinnae in few pairs (up to about 10 pairs) :
Leaflets about 10–15 pairs, small and more or less contiguous :
Spines very thick and straight, up to 1·5 cm. long ; fruit at length sickle-shaped, becoming rather thick ; leaflets and branchlets pubescent or glabrous, the latter pale grey ; spikes about equal to or a little longer than the leaves ; calyx glabrous or pubescent .. .. 2. *albida*
Spines recurved, glossy and horn-like ; fruit remaining straight, flat and thin, puberulous, transversely nerved ; leaflets glabrous or nearly so, glaucous-green ; spikes longer than the leaves ; calyx glabrous or slightly pubescent 3. *senegal*
Leaflets 3–5 pairs, glaucous-green, obliquely obovate-oblong, about 1 cm. long, distinctly nerved, glabrous ; rhachis with a small gland towards the base ; spikes longer than the leaves ; calyx glabrous ; fruits flat and thin, few-seeded, often constricted, prominently transversely nerved, up to 7 cm. long and 2·5 cm. broad .. .. 4. *laeta*
Pinnae in numerous pairs (15–40 pairs) ; leaf-rhachis with a large disk-like gland towards the base and with a smaller gland between each of the upper pairs ; spines recurved, with a very broad decurrent base ; spikes a little shorter than the leaves ; fruits narrow, 12–15 cm. long and 1·5 cm. broad, glabrous, reticulate 5. *campylacantha*
Prickles between the nodes of the branchlets, not stipular, the stipules soon deciduous :
Leaf-rhachis with a large flat elliptic gland towards the base scarcely raised above the surface ; pinnae in numerous pairs (15 or more) ; axis of the inflorescence rather villous ; fruits slightly pubescent, few-seeded, flat 6. *macrostachya*
Leaf-rhachis with an ovoid gland towards the base standing well up from the surface ; pinnae in usually rather few pairs ; axis of the inflorescence tomentellous ; fruits glabrous, several-seeded .. .. 7. *ataxacantha*
Flowers in globose heads :
Flower-heads on simple or subsimple axillary peduncles :
Bracteoles above the middle or towards the top of the peduncle in the open flower :
Branchlets glabrous or nearly so :
Fruits more or less turgid when ripe, curved, up to about 10 cm. long and 1·5 cm. broad, longitudinally striate, becoming glabrous, few-seeded ; pinnae up to 10 pairs ; leaflets about 20 pairs, linear-oblong, up to 7 mm. long, glabrous ; spines up to 3 cm. long, acicular, very sharp .. .. 8. *Farnesiana*

Fruits flat and woody when ripe, curved, about 16 cm. long, up to 3 cm. broad, smooth when ripe ; pinnae about 20 pairs ; leaflets as in *A. Farnesiana* ; spines acicular, up to 5 cm. long, very sharp .. .. .. 9. *Sieberiana*

Branchlets softly yellowish-tomentellous .. 11. *Rehmanniana* (see below)

Bracteoles about or below the middle of the peduncle in the open flower :

Fruits not spirally coiled or twisted :

Branchlets glabrous or at most very slightly pubescent only when young ; fruits falcate, glabrous, not or only very slightly constricted between the seeds, slender,

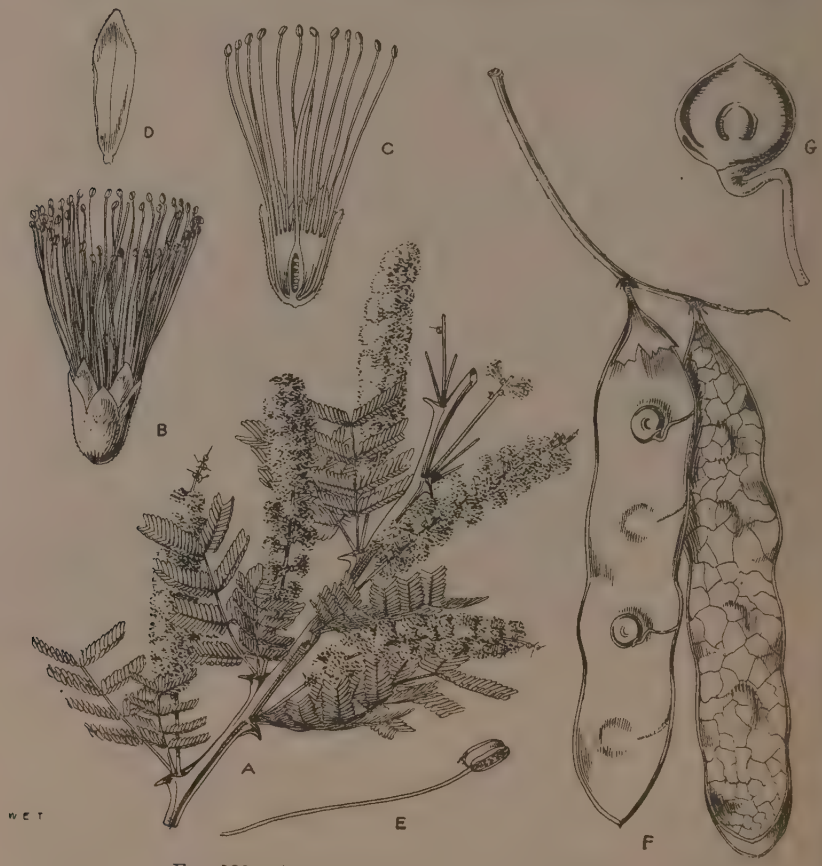

FIG. 139.—ACACIA SENEGAL *Willd.* (MIMOSACEAE).

A, flowering branch. B, flower. C, longitudinal section of flower. D, calyx-lobe. E, stamen. F, mature pods. G. seed.

several to each head, about 10 cm. long and 6 mm. broad ; spines straight, acicular, up to 3·5 cm. long ; pinnae 6-9 pairs ; leaflets linear-oblong, about 6 mm. long .. .. 10. *Seyal*

Branchlets permanently softly puberulous or tomentose, or if nearly glabrous, then fruits constricted between the seeds :

Branchlets yellowish-tomentellous ; fruits not constricted between the seeds, about 14 cm. long and 2 cm. broad, glabrous, rather woody and thick ; pinnae about 20 pairs ; leaflets very small, numerous, thinly pubescent ; spines straight, up to 6·5 cm. long, on the younger shoots up to 2·5 cm. long 11. *Rehmanniana*

Branchlets whitish-puberulous or shortly pubescent; fruits more or less constricted between the seeds:

Fruits quite glabrous:

Fruits mostly very narrowly constricted between the seeds, segments not umbonate in the middle; spines up to 9 cm. long, very stiff and acicular, sharp; pinnae rather few pairs; leaflets more or less as in *A. Seyal* 12. *nilotica*

Fruits broadly constricted between the seeds, segments very prominently umbonate in the middle; spines up to 4 cm. long, acicular, sharp; pinnae 6–8 pairs, the rhachis pubescent; leaflets shortly linear, 3–4 mm. long 13. *Kirkii*

Fruits softly tomentose, variously constricted between the seeds, sometimes narrowly so; spines and leaflets as in *A. nilotica* .. .. 14. *arabica*

Fruits spirally coiled and twisted, up to 12 cm. long, slender, nervose; spines acicular, up to 4 cm. long, sharp; pinnae 2–5 pairs; leaflets oblong-lanceolate, 4 mm. long; peduncles slender, fasciculate .. .. 15. *tortilis*

Flower-heads in terminal much-branched panicles:

Branchlets with numerous prickles between the nodes and often on the leaf-rhachis and inflorescence; climber; pinnae in numerous pairs; leaflets numerous and very small, contiguous or nearly so, linear, with the nerve along the margin on one side; fruits linear-oblong, about 12 cm. long and 3 cm. broad, glabrous 16. *pennata*

Branchlets without prickles between the nodes; tree; pinnae fairly numerous, leaflets fairly numerous, not contiguous, with the nerve nearly in the middle; fruits narrowly linear-oblong, about 12 cm. long and 1·5 cm. broad 17. *macrothyrsa*

1. **Acacia mellifera** *Benth.*—F.T.A. 2: 340; Benth. in Trans. Linn. Soc. 30: 517; Holl. 2: 293. *A. gourmaensis* A. Chev. A common white-flowered small-leaved tree in bush savannah.
French Sudan: Gourma (July)! Gold Coast: Kwahu (fr. Jan.)! N. Nigeria: near Jebba (Mar.)! Ilorin district, R. Awan! Also in N.E. Africa and south to Tanganyika Territory and in S. Arabia. Exsicc.—*Chipp* 639. *Dalz.* 1217. *Barter* 1144. *Chev.* 24319; 24364; 24482. (See Appendix).
2. **A. albida** *Del.*—F.T.A. 2: 339; Benth. l.c. 515; Holl. 2: 288; Chev. Bot. 243. A large tree with spiny branchlets and pale glaucous foliage either glabrous or pubescent; flower-spikes yellow; fruits yellowish-green when dry.
French Sudan: several localities. Senegal: several localities! Gambia: Fondi country! N. Nigeria: N. Bornu (Dec.)! Kano (Jan., fr. May)! Sokoto (Sept.)! Katagum (Sept.)! Extends throughout the drier parts of N. Africa into Egypt; also in East Africa, Zambesi Basin and the Transvaal. Exsicc.—*Heudelot* 391. *Roger. Dawe* 80. *Elliott* 142. *Lamb* 13. *Dalz.* 53; 314. (See Appendix).
3. **A. senegal** *Willd.*—Benth. l.c. 516; Chev. Bot. 246; Holl. 2: 293. *A. Verek* Guill. & Perr. Tent. Fl. Seneg. 245, t. 56—F.T.A. 2: 342; Chev. Bot. 247. *A. Dudgeoni* Craib. *A. Samoryana* A. Chev. Like the preceding but fruits flat, thin, and straight, finely hairy: flowers creamy white, drying yellowish.
Mauritania: Tamourt. French Sudan: several localities. Senegal: several localities! N. Nigeria: Katagum (fl. and fr. July)! Kontagora (Jan.)! Gujba (Dec.)! Geidam (fr. Oct.)! Extends eastwards to the Red Sea and Eastern India. Exsicc.—*Heudelot. Brunner* 9. *Dudgeon* 1; 58. *Dalz.* 41; 55. *Foster* 80. *Chev.* 24326 or 24236; 24816. (See Appendix).
4. **A. laeta** *R. Br.*—F.T.A. 2: 341; Chev. Bot. 245 ("*A. lactea*" by error). *A. trentiniani* A. Chev. A small glabrous tree with black curved spines and spikes of white flowers.
French Sudan: Timbuktu! Also in E. Sudan. Exsicc.—*Chev.* (no number); and 1185 bis.
5. **A. campylacantha** *Hochst.* ex *A. Rich.* Tent. Fl. Abyss. 1: 242; Holl. 2: 290; Lely, Usef. Trees N. Niger. 3, with figure. *A. Catechu* Oliv. F.T.A. 2: 344, not of Willd. *A. Suma* Benth. l.c.; Chev. Bot. 247; not of Kurz. A tree 30–60 ft. high, sometimes gregarious, with pale yellowish bark; flowers creamy white drying yellowish, and flat brown pods.
French Sudan: Gourma (July). Gold Coast: N. Ashanti, Bjury (July)! Togo: Kpedsu! Dahomey: Savalou district (May)! N. Nigeria: Sokoto (May)! Katagum! Yola (fr. Oct.)! Kano and Zaria (May)! S. Nigeria: Lagos! Eastwards to the Red Sea and south to the Transvaal. Exsicc.—*Chipp* 502. *Lely* 837. *Dalz.* 51. *Shaw* 72. *Foster* 82. *Chev.* 23717. *Howes* 1069. (See Appendix).
6. **A. macrostachya** *Reichenb.* ex *Benth.*—F.T.A. 2: 343; Benth. l.c. 520; Chev. Bot. 245. A tree with rusty-pubescent branchlets, armed with recurved prickles; flower-spikes creamy white or pale yellow.
French Sudan: Taranoro (May)! Macina (Sept.)! Senegal! Sierra Leone! N. Nigeria: Sokoto Prov. (fl. June; fr. Oct.)! Also in Eastern Sudan and Angola. Exsicc.—*Chev.* 835. *Sieber* 44. *Dalz.* 312; 536. (See Appendix).
7. **A. ataxacantha** *DC.*—F.T.A. 2: 343; Benth. l.c. 520; Chev. Bot. 244. A scrambling shrub or climber forming thickets; armed with recurved prickles; flowers in white spikes; pods thin, flat, 3–5 in. long, ½–¾ in. broad, acutely beaked.
Throughout the drier parts of our area and to the Eastern Sudan. Exsicc.—*Heudelot* 536. *T. Vogel* 187. *Sc. Elliot* 4293; 4457B. *Chev.* 3366. *Dalz.* 50. *Elliott* 134. *Linder* 1314. (See Appendix).
8. **A. Farnesiana** *Willd.*—F.T.A. 2: 346; Benth. l.c. 502; Holl. 2: 292; Chev. Bot. 245. A spiny shrub with very fragrant yellow flower-heads.
Cultivated throughout the tropics, and in S. Europe, probably native in America. Exsicc.—*T. Vogel* 1. *Sc. Elliot* 4121. *Brown* 363. *McLeod* 810. *Warnecke* 193. *Elliott* 184. *Foster* 86; 179. (See Appendix).
9. **A. Sieberiana** *DC.*—F.T.A. 2: 347; Benth. l.c. 503; Holl. 2: 296. A tree 30–50 ft. high, with smooth pale yellowish bark, straight spines, white when old, and creamy white flower-heads.
Senegal: Richard Tol (May)! Sierra Leone: York (Jan.)! Togo: Kpedsu (fr. Jan.)! N. Nigeria: a common savannah tree, flowering usually Mar. to June! Extends to E. Sudan, Congo and Angola. Exsicc.—*Sieber* 43. *Döllinger* 57. *E. Vogel* 85. *Barter* 1208. *Elliott* 151. *Dalz.* 300; 583. (See Appendix).
10. **A. Seyal** *Del.*—F.T.A. 2: 351; Benth. l.c. 512; Holl. 2: 295; Chev. Bot. 246. A tree 15–30 ft. high, with yellow or rusty ochraceous bark, abundant yellow fragrant flower-balls, and narrow curved flat pods, which split and remain on the tree.
Common in open savannah and sometimes forming forests; from Mauritania and Senegal to Eastern Sudan, Nile Land and East Africa. Exsicc.—*Sieber* 45. *E. Vogel* 20. *Barter* 1595. *Elliott* 111; 163. *Dalz.* 47; 347; 611. *Foster* 77. (See Appendix).
11. **A. Rehmanniana** *Schinz* in Bull. Herb. Boiss. 6: 525. A thorny tree in savannah with creamy white flower-heads and pale yellow bark.

French Sudan: Ouré (Apr.)! Gold Coast: N. Territory, Lorha (Mar.)! Barbitu (Feb.)! Togo Sokode (Feb.)! Extends through the savannah country of E. Africa south to Transvaal and Natal. Exsicc.—*Chev.* 700. *McLeod* 831. *Dudgeon* 100. *Kersting* A 313. (See Appendix).

12. **A. nilotica** *Del.*—F.T.A. 350, and Benth. l.c. 506, under *A. arabica* Willd. A fairly large tree, attaining a girth of 10 ft., or in inundated ground a smaller tree with spreading branches and semi-spherical crown; flowers in yellow balls; fruits about 6 in. long, like a string of flattened beads.

N. Nigeria: Sokoto (Feb.)! Bornu and Lake Chad! Extends to Eastern Sudan and Nile Land. Exsicc. —*Lely* 810. *Talb.* 1230. (See Appendix).

13. **A. Kirkii** *Oliv.*—F.T.A. 2: 350; Chev. Bot. 245. A tree with yellow flower-heads resembling *A. arabica*.

French Sudan: Macina (Aug.)! Also in Rhodesia and probably E. Africa. Exsicc.—*Chev.* (no number).

14. **A. arabica** *Willd.*—F.T.A. 2: 350 (excl. syn. *A. nilotica* Del.); Benth. l.c. 506, partly; Holl. 2: 288; Chev. Bot. 244, including var. *Adansonii* A. Chev. l.c. *A. Adansonii* Guill. & Perr. A tree like the preceding species, 20–25 or more feet high, stem and branches usually dark-coloured.

A very common tree throughout the northern parts of the area, often in ground liable to inundation; extending to India and South Tropical Africa. Exsicc.—*Heudelot* 488. *Barter* 1626. *Elliott* 136. *Dalz.* 54. *Lely* 809. *Warnecke* 323. *Kersting* 101. (See Appendix).

15. **A. tortilis** *Hayne*—F.T.A. 2: 352; Benth. l.c. 506; Chev. Bot. 247. A glabrous tree with red-brown branchlets; flowers in yellow balls.

Mauritania. French Sudan; Timbuktu (July)! Korioumé; Kabara; Sansanding. Senegal: several localities! N. Nigeria: Lake Chad! Extends to Red Sea and Nile Land. Exsicc.—*Sieber. Heudelot* 495. *Foster* 92. (See Appendix).

16. **A. pennata** *Willd.*—F.T.A. 2: 345; Benth. l.c. 345; Chev. Bot. 245. A prickly climbing shrub; flowers in numerous small white balls turning yellowish.

Very common in forests throughout the area, also in the French Sudan and N. Nigeria; extending throughout tropical Africa to S. Rhodesia. Exsicc.—*Mann* 852. *Cummins* 47. *Millen* 86. *Elliott* 182. *Talb.* 1252; 3620. *Linder* 766.

17. **A. macrothyrsa** *Harms* in Engl. Bot. Jahrb. 28: 396. *A. prorsispinula* Stapf. *A. Dalzielii* Craib. A tree 20–35 ft. high, sometimes scarcely armed; pinnae sometimes 20 or more pairs, with 50 or more pairs of leaflets; flower-heads abundant, golden yellow; fruits flat, remaining on the tree.

Gold Coast: Nangruma to Santejan (May)! N. Nigeria: Sokoto Province, abundant locally (fl. and fr. Dec.)! Yola (Oct.)! S. Bornu (fr. Dec.)! extending to Eastern Sudan, Uganda, East Africa and S. Rhodesia. Exsicc.—*Kitson* 776. *Dalz.* 320. *Shaw* 85. *Foster* 87. *Gilman* 1. *Lely* 826. (See Appendix).

19. ALBIZZIA Durazz.—F.T.A. 2: 355; Benth. in Trans. Linn. Soc. 30: 557 (1875).

Staminal tube included in the corolla-tube or only slightly exserted:

Calyx-tube glabrous outside; flowers distinctly pedicellate; pinnae 2–3-jugate, with a gland at the base between each pair; leaflets about 5 pairs, oblong to obovate, the uppermost pair the largest (up to 4·5 cm. long and 2·5 cm. broad), pilose on and towards the midrib beneath, strongly nerved; peduncles 5–9 cm. long, grooved, glabrescent .. .. 1. *glaberrima*

Calyx-tube pubescent or tomentose outside:

Peduncles glabrous or very slightly and shortly pubescent:

Leaflets unequal-sized, the uppermost pair the largest, usually few pairs:

Leaflets rounded at the apex, oblong-obovate, up to 4 cm. long and 2 cm. broad, strongly reticulate, with a small gland between the base of each; peduncles up to 12 cm. long; flowers pedicellate; calyx about 5 mm. long; corolla hairy only at the tips of the lobes; fruits about 20 cm. long and 4 cm. broad, reticulate 2. *Lebbek*

Leaflets pointed at the apex, obliquely elliptic, laxly reticulate, up to 4 cm. long and 2 cm. broad, glabrous or nearly so, with a gland here and there between the base; peduncles 2–3 cm. long, slightly pubescent; flowers rather long-pedicellate; calyx about 2 mm. long; corolla pubescent all over; fruit linear-oblong, 17 cm. long and 3 cm. broad .. .. 3. *Warneckei*

Leaflets subequal-sized, the uppermost pair usually the smallest, numerous, narrowly oblong, 2–3 cm. long, 0·5–1·3 cm. broad, slightly pubescent on the midrib below; rhachis shortly pubescent; peduncles slightly pubescent, up to 6 cm. long; flowers subsessile; calyx slightly pubescent, about 7 mm. long; fruit 20 cm. long, 4 cm. broad, transversely nerved .. .. 4. *coriaria*

Peduncles densely and softly tomentose or pubescent; flowers subsessile:

All parts greyish-pubescent; pinnae 6–8 pairs; leaflets falcate-lanceolate, acute, about 1 cm. long; fruits linear-lanceolate, 10 cm. long and 2·5 cm. broad, minutely pubescent or nearly glabrous .. .. 5. *Chevalieri*

All parts rusty-tomentose; pinnae 4–7 pairs; leaflets oblong, rounded at the apex, 1–2 cm. long; fruits linear-oblong, about 20 cm. long and 4·5 cm. broad, glabrous 6. *ferruginea*

Staminal tube much exserted from the corolla-tube:

Pinnae 6–8 pairs; leaflets 8–16 pairs, small, pairs contiguous or nearly so; leaf-rhachis with a large sessile gland near the base and often a smaller one between the uppermost pinnae; leaflets obliquely oblong, pubescent; fruits linear-oblong, about 15 cm. long and 2·5 cm. broad, conspicuously reticulate .. .. .. 7. *sassa*

Pinnae 2–3 pairs; leaflets 3–5 pairs, the uppermost pair the largest, not contiguous; glands as above; leaflets obliquely obovate-elliptic, strongly nerved, glabrous or nearly so below; fruits linear, up to 30 cm. long and 4 cm. broad, laxly and obscurely reticulate .. .. 8. *Zygia*.

1. **Albizzia glaberrima** *Benth.*—F.T.A. 2: 358. *A. rhombifolia* Benth.—F.T.A. 2: 358; Chev. Bot. 249, *Mimosa glaberrima* Schum. & Thonn. A tree up to 90 ft. high, buttressed at the base; flowers white, yellowish or red, fragrant.

French Guinea: Rio Nunez! Pays des Guerzés. Sierra Leone: near Tassin and Kukum (Jan.)! Wallia (Jan.)! Ivory Coast: Bouroukrou; Zaranou; Dabou. Exsicc.—*Heudelot* 735. *Sc. Elliot* 4418; 4745. (See Appendix).

2. **A. Lebbek** *Benth.*—F.T.A. 2: 358; Benth. l.c. 562; Chev. Bot. 249. A tree commonly cultivated in the tropics, and half naturalised on old farms, etc. Exsicc.—*Mann* 416. *Brunner. Lelièvre.*
3. **A. Warneckei** *Harms* in Engl. Bot. Jahrb. 30: 75. A shrub or tree up to 45 ft. high, giving a resinous exudation; flowers brownish-yellow.

Togo: near Lome (fl. and fr. Feb.)! Also in French Cameroons. Exsicc.—*Warnecke* 57.

4. **A. coriaria** *Welw.*—F.T.A. 2: 360. *A. Poissoni* A. Chev. A tree with the habit of *A. Lebbek*, in savannah and deciduous forests, up to 90 ft. high.

Gold Coast: West Ashanti, Nsuatra (fr. Dec.)! Togo! Dahomey: Savalou; Gouka (May)! N. Nigeria: Maigana (fl. Mar., fr. Dec.)! S. Nigeria: near Lagos! Extends to Angola, Uganda and Kenya. Exsicc.—*Chipp* 783. *Lamb* 63; 93. *Moloney. Kersting* A 513. *Chev.* 23722. (See Appendix).

5. **A. Chevalieri** *Harms* in Bull. Soc. Bot. Fr. Mém. 8: 17; Chev. Bot. 248. A tree 20–30 ft. high, unarmed, with grey corky bark and white flower-heads with long pinkish stamens.

FIG. 140.—ALBIZZIA SASSA *Macbride*. (MIMOSACEAE).
A, flowering branch. B, C, flowers. D, fruits.

French Sudan: Djenné (June)! Toulimandro; Gourma. N. Nigeria: common in savannah forests (Apr., May)! Exsicc.—*Dalz.* 48; 310. *Dudgeon* 7. *Foster* 91. *Talb.* 1214. (See Appendix).

6. **A. ferruginea** *Benth.*, partly—F.T.A. 2: 361, partly; Hutch. in Kew Bull. 1916: 238. A tree up to 60 ft. high, with rough flaking bark, in deciduous forests.

Senegal: ? locality! Tamboukane (fr. Dec.)! Gold Coast: Kumasi (Mar.)! Togo! N. Nigeria: Agaie (Feb.)! S. Nigeria: Awka! Ahoada! Exsicc.—*Heudelot* 881. *Chipp* 789. *Yates* (no number). *Chev.* 2104. *Baumann* 448. (See Appendix).

7. **A. sassa** *Macbride* in Contrib. Gray Herb. No. 59: 4. *A. fastigiata* Oliv.—F.T.A. 2: 361; Benth. l.c. 570; Holl. 2: 298; Chev. Bot. 248. *Inga sassa* Willd. A large tree; flowers white with crimson-tipped stamens, numerous in fascicled corymbose heads.

Throughout the area in mixed deciduous forests; extending to Angola, Uganda, East Africa and N. Rhodesia. Exsicc.—*Heudelot* 16. *Mann* 830. *Barter* 495. *Sc. Elliot* 4303; 5314. *Kirk* 15. *Johnson* 638. *Whyte. Cummins. Elliott* 223. *Rowland. Chev.* 16218; 17307; 22787. (See Appendix).

8. **A. Zygia** *Macbride* l.c. 3. *A. Brownei* Oliv.—F.T.A. 2: 362; Holl. 2: 297; Chev. Bot. 248. *Inga Zygia* DC. A tree resembling the preceding but with much larger leaflets and pods, reaching 70 ft. or more in height with a bole of 30 ft. in dense forest; flower-heads with red stamens, in corymbose racemes (Feb.-

Apr.) ! Throughout the area, common in fringing forests, up to 11° N. lat. in Nigeria ; extending to Eastern Sudan and to Gabon and Uganda. Exsicc.—*Heudelot* 800. *Barter* 584. *Mann* 2240. *Sc. Elliot* 4151 ; 4581. *Irving*. *Rowland*. *Pobéguin* 679. *Chev.* 3121 ; 23142. (See Appendix).

Imperfectly known species.

A. gigantea *A. Chev.* Vég. Util. Afr. Trop. Franç. 5 : 171 ; Bot. 249. *Pentaclethra gigantea* A. Chev. Bot. 237, name only.

The specimen in Chevalier's herbarium is a barren leafy shoot ; pinnae 4–5 pairs ; rhachis pubescent, with a fleshy gland near the base ; leaflets 5–10 pairs, subequal, oblong, apiculate, 2·5–4·5 cm. long, 1–2 cm. broad, pubescent mainly on the midrib below.

Ivory Coast : Yapo, in the forest ! Bouroukrou ! Exsicc.—*Chev.* 16151 ; B 22326. (See Appendix).

20. CATHORMION Hassk. in Retzia 1 : 231 (1855) ; Merrill in Journ. Wash. Acad. Sci. 6 : 43 (1916).—F.T.A. 2 : 363, as *Pithecolobium* Mart.

A tall tree ; branchlets and leaf-rhachis rusty-pubescent ; leaves bipinnate ; pinnae 5–7 pairs, opposite ; leaflets about 20 pairs, opposite, oblong-lanceolate, truncate at the base, obtuse at the apex, 1–1·5 cm. long, about 4 mm. broad, with numerous distinct lateral nerves, glabrous ; flowers capitate ; peduncles 2–2·5 cm. long, shortly pubescent ; calyx tubular, toothed, fringed with short hairs ; corolla glabrous ; stamens numerous, united at the base ; fruits circinate, jointed, 15–20-seeded, flattened .. .. 1. *altissimum*

A tall tree ; branchlets and leaf-rhachis pubescent ; leaves bipinnate ; pinnae 20–30 pairs, opposite ; rhachis with a gland towards the base and glands between some of the upper pinnae ; leaflets up to 40 pairs, very close, linear, auriculate on one side at the base, about 3–4 mm. long, slightly ciliate when young ; flowers capitate ; peduncles often paired, axillary, about 2–4 cm. long, rusty-tomentellous ; calyx tubular, dentate, 3 mm. long, like the corolla tomentellous ; stamens 10 ; fruits nearly straight, jointed, about 25-seeded, 20 cm. long and 1·4 cm. broad .. 2. *Dinklagei*

1. **Cathormion altissimum** *Hutch. & J. E. Dandy* in Kew Bull. 1928 : ined. *Pithecolobium altissimum* Oliv.—F.T.A. 2 : 364 ; Benth. l.c. 586 ; Holl. 2 : 300 ; Chev. Bot. 249. *Albizzia Passargei* Harms. A forest or riverside tree.

Sierra Leone : Njala ! Ivory Coast : Bingerville, on the edge of the lagoon. Gold Coast : Cape Coast (July) ! Tano River (Sept.) ! S. Nigeria : Nun River (fl. and fr. Sept.) ! Abo ! Bonny (fr. Dec.) ! Cameroons River (fl. and fr. Jan.) ! Also in French Cameroons and Belgian Congo. Exsicc.—*T. Vogel* 18. *Mann* 469 ; 2215. *Barter* 105. *Dalz.* 8070. *Unwin* 25. *Chipp* 336. *Lane-Poole* 111. (See Appendix).

2. **C. Dinklagei** *Hutch. & J. E. Dandy* l.c., ined. *Mimosa Dinklagei* Harms. *Albizzia Dinklagei* Harms. A tree about 50 ft. high, with rusty-pubescent branchlets and leaf-rhachis, and white flowers.

French Guinea : between Konkouré and Timbo (Mar.) ! Sierra Leone : Bagroo R. (Apr.) ! Sherboro ! Moria (Feb.) ! Freetown (Mar.) ! Kennema (Mar.) ! Falaba (Apr.) ! Liberia : Grand Bassa ! Also in French Cameroons. Exsicc.—*Mann* 836. *Sc. Elliot* 4561 ; 8531. *Dalz.* 961. *Lane-Poole* 204. *Aylmer* 17. *Dinklage* 1827. *Chev.* 12448.

21. CALLIANDRA Benth.—F.T.A. 2 : 354 ; Benth. in Trans. Linn. Soc. 30 : 536 (1875).

Shrub with slender unarmed branches ; stipules persistent, lanceolate, nervose ; leaves bipinnate ; pinnae 2–5 pairs, opposite ; leaflets 8 or more pairs, linear-oblong, subacute, 1–1·5 cm. long, about 4–5 mm. broad, slightly pubescent ; flowers in small axillary heads on very slender peduncles up to 4 cm. long ; stamens numerous, with very slender filaments ; fruit flat, linear, narrowed to the base, dehiscent, 10–15 cm. long, with very prominent sutures and bulging seeds .. .. *portoricensis*

C. portoricensis *Benth.*—F.T.A. 2 : 354 ; Benth. l.c. 543. A glabrous shrub.

Togo : Misahöhe (Nov.) ! S. Nigeria : Lagos ! Bonny (Oct.) ! Oban ! Obu ! Aguku ! Ukunzu ! Common in the West Indies and on the Atlantic coast of America. Exsicc.—*Mann* 510. *MacGregor* 87. *Talb.* 589 ; 1313 ; 1313A. *Thomas* 473 ; 622 ; 730 ; 1016 ; 1619 ; 2198. *Mildbraed* 7333.

82. PAPILIONACEAE

Trees, shrubs, climbers or herbs. Leaves compound or simple, usually stipulate : leaflets sometimes stipellate. Flowers zygomorphic, mostly hermaphrodite. Sepals usually 5, more or less connate. Petals 5, imbricate, free or rarely partially coherent, the upper (adaxial) exterior and forming the standard (vexillum), the two lateral the wings (alae) more or less parallel with each other, the lower two interior and connate by their lower margins into a keel (carina). Stamens often 10, monadelphous or diadelphous, rarely free, mostly all perfect ; anthers usually opening lengthwise by slits. Fruit dehiscent or not. Seeds without endosperm or very rarely with scanty endosperm.

A large, homogeneous and easily recognised family, generally distributed throughout the world ; most numerous in warmer regions.

Key to the tribes.

Stamens free (or nearly free) from each other, not united into a tube or sheath :

Stamens numerous (more than 10) ; petal 1 (or 6 or 0) ; calyx closed in bud ; trees with pinnate or 1-foliolate leaves ; fruit drupaceous or indehiscent

I. SWARTZIEAE

Stamens 10; petals 5. Trees, tall shrubs or tall climbers (rarely dwarf shrubs or subshrubs); leaves imparipinnately multifoliolate or 1-foliolate; leaflets entire; fruit in some drupaceous
II. SOPHOREAE

Stamens all (or all but one) united into a tube or sheath:
Fruits not jointed:
Trees, woody shrubs or tall woody climbers (see also *Erythrina*):
Fruit indehiscent; leaves pinnately 3- or more-foliolate or rarely 1-foliolate, mostly with stipels
III. DALBERGIEAE

Fruit dehiscent:
Leaves pinnately compound; anther usually uniform
IV. GALEGEAE

Leaves digitately 3-foliolate; leaflets entire or single; anthers usually of 2 kinds; stamens completely monadelphous
V. GENISTEAE

Herbs erect or procumbent, or herbaceous climbers:
Leaves with a terminal leaflet (no tendrils):
Stipels 0; mostly erect herbs or subshrubs:
Stamens completely monadelphous; anthers usually of 2 kinds; leaves 3-foliolate; leaflets entire
V. GENISTEAE

Stamens diadelphous (mostly 9 and 1):
Leaflets entire:
Flowers in racemes or panicles; stamens filamentous, not broadened at the apex
IV. GALEGEAE

Flowers umbellate; leaves digitately 3-foliolate, the stipules leaf-like; stamens (some or all) broadened at the apex
VI. LOTEAE

Leaflets toothed; flowers often capitate
VII. TRIFOLIEAE

Stipels (subtending the *leaflets*) present; stamens not broadened at the apex:
Ovary not surrounded by a disk; erect (rarely climbing) herbs, leaves pinnately 3- or ∞-foliolate
IV. GALEGEAE

Ovary surrounded by a disk; procumbent or twining herbs; leaves pinnately 3-foliolate
VIII. PHASEOLEAE

Leaves without a terminal leaflet, the rhachis produced into a tendril or bristle; inflorescence axillary; climbing herbs with brightly coloured ornamental seeds
IX. VICIEAE

Fruits jointed, constricted between the seeds and often breaking into 1-seeded portions; stipels sometimes present
X. HEDYSAREAE

Tribe I.—SWARTZIEAE

Leaves pinnate:
Petal 1, orbicular, clawed; ovary and fruit shortly stipitate; flowers few in short racemes; fruits cylindrical, with numerous seeds 1. **Swartzia**
Petals absent; ovary and fruit long-stipitate, the latter ellipsoid, 2–3-seeded; flowers in rather dense racemes; calyx closed in bud .. .. .. 2. **Cordyla**
Leaves 1-foliolate; ovary sessile, 2-ovuled; calyx closed in bud; petals 6, subequal. 3. **Baphiopsis**

Tribe II.—SOPHOREAE

Leaves pinnate or trifoliolate:
Flowers racemose:
Fruits torulose, turgid; racemes terminating the young shoots; calyx truncate 4. **Sophora**
Fruits more or less torulose; racemes on the older wood; calyx shortly lobed 5. **Angylocalyx**
Flowers paniculate; leaflets stipellate:
Calyx lobed to about the middle; fruit flat, with a faint intramarginal nerve 6. **Afrormosia**
Calyx dentate; fruit 1-seeded, flat, without an intramarginal nerve, the valves submembranous, winged all round, reticulate: .. .. .. 7. **Amphimas**
Leaves 1-foliolate:
Calyx 5-lobed to below the middle; fruit flat, obovate-elliptic, 1-seeded; flowers few in short racemes on the young shoots .. .. 8. **Haplormosia**

Calyx 2-fid or split down one side :
Anthers linear, longer than the filaments ; petals nearly equal ; fruit 1-seeded, stipitate ; seeds with a large spongy aril .. .. 9. **Leucomphalus**
Anthers shorter than the filaments ; fruits more than 1-seeded .. .. 10. **Baphia**

Tribe III.—Dalbergieae

Leaflets exstipellate ; anthers basifixed (not versatile), opening by a terminal or longitudinal slit ; fruits few- to 1-seeded :
Fruits more or less oblong, generally flat and thin .. .. .. 11. **Dalbergia**
Fruits suborbicular or obovate-semilunar with one side straight 12. **Ecastaphyllum**
Leaflets stipellate ; anthers medifixed, versatile, opening by longitudinal slits :
Leaflets alternate :
Fruits more or less flattened :
Fruits suborbicular, winged, smooth, bristly or verrucose ; inflorescence racemose or paniculate ; stipules not spinescent .. .. 13. **Pterocarpus**
Fruits broadly sickle-shaped, laxly nervose, glabrous ; flowers in small axillary and terminal panicles ; stipules spinescent .. .. .. 14. **Drepanocarpus**
Fruits ovoid, turgid ; seed solitary, pendulous ; flowers in lax spreading panicles 15. **Andira**
Leaflets opposite :
Wing-petals free from the keel ; fruits not winged, flat .. 16. **Ostryocarpus**
Wing-petals adnate up to the middle of the keel :
Flowers arranged in clusters on the raceme ; fruit narrowly winged on one side only 17. **Leptoderris**
Flowers arranged more or less singly on the axis of the raceme :
Fruits winged on each side .. .. 18. **Ostryoderris**
Fruits not winged .. .. 19. **Lonchocarpus**

Tribe IV.—Galegeae

Trees or tall woody climbing shrubs ; leaflets with spreading nervation, the hairs (when present) basifixed :
Fruits at length dehiscent ; calyx-teeth broad ; mostly trees or woody climbers :
Leaflets opposite, never trifoliolate .. .. 20. **Millettia**
Leaflets alternate or if trifoliolate then the pair opposite .. .. 21. **Craibia**
Fruits indehiscent ; calyx-teeth linear ; small shrub ; flowers in terminal and leaf-opposed racemes .. .. 22. **Mundulea**
Herbs or under-shrubs :
Hairs on the leaves, etc. (if present), not medifixed :
Racemes or panicles terminal or leaf-opposed :
Leaves pinnate, leaflets not stipellate ; leaflets with numerous closely parallel nerves ; vexillary stamen connate about the middle with the others ; flowers racemose or fasciculate .. .. 23. **Tephrosia**
Leaves simple, leaflets not stipellate ; vexillary stamen connate its full length ; prostrate herb ; stipules scarious ; flowers glomerate .. .. 24. **Melliniella**
Leaves trifoliolate, leaflets stipellate, with spreading not parallel lateral nerves ; vexillary stamen free from the base upwards .. .. .. 25. **Pseudarthria**
Racemes axillary or rarely the flowers solitary and axillary :
Leaves not gland-dotted :
Leaves pinnate :
Fruits elongated, often torulose ; slender herbs with glaucous leaves and often showy flowers .. .. 26. **Sesbania**
Fruits very short, not torulose ; small annual with procumbent stems covered with appressed hairs .. .. 27. **Astragalus**
Leaves unifoliolate ; fruits very short :
Leaves broadly obovate ; subwoody herb fruits 1-seeded ; flowers axillary, subsessile .. .. 28. **Requienia**
Leaves linear ; small slender herb ; fruits 8-10-seeded ; flowers in slender axillary racemes .. .. 29. **Microcharis**
Leaves gland-dotted, pinnately trifoliolate ; fruits 1-seeded ; racemes axillary, stout .. .. 30. **Psoralea**
Hairs on the leaves medifixed ; racemes or spikes axillary ; anthers apiculate :
Vexillary stamen free from the others ; valves of the fruit not grooved 31. **Indigofera**
Vexillary stamen united with the others ; valves of the fruit not longitudinally grooved, beaked .. .. 32. **Cyamopsis**

Tribe V.—Genisteae

Staminal tube slit in the upper part :
Style straight ; fruit inflated ; small branched annual with axillary subsessile flowers 33. **Rothia**
Style abruptly bent near the base ; fruit often turgid but hardly inflated ; leaves trifoliolate or rarely unifoliolate .. .. 34. **Crotalaria**
Staminal tube not slit in the upper part :
Calyx-lobes longer than the tube ; leaves 5-7-foliolate ; annual with villous stems ; flowers laxly racemose .. .. 35. **Lupinus**
Calyx-teeth shorter than the tube ; leaves 3-foliolate ; flowers in dense sessile terminal heads ; fruits viscous .. .. 36. **Adenocarpus**

Tribe VI.—Loteae

Leaves trifoliolate with leaf-like stipules ; flowers umbellate ; annuals or perennials, often woody at the base .. .. 37. **Lotus**

Tribe VII.—Trifolieae

Fruits straight or nearly so, rarely falcate :
Flowers in long racemes ; fruits very small, suborbicular, rugose .. 38. **Melilotus**
Flowers in heads or short racemes or subsolitary :
Fruits several-seeded, elongated, much longer than the calyx ; flowers subsessile in the axils of the leaves .. .. 39. **Trigonella**
Fruits 1-4-seeded, not longer than the calyx ; flowers in heads .. 40. **Trifolium**
Fruits spirally coiled ; stipules leafy ; flowers crowded in short axillary racemes 41. **Medicago**

Tribe VIII.—Phaseoleae

Leaves gland-dotted below :
Ovules 4 or more :
Erect shrubs ; flowers in subcapitate axillary racemes ; fruits obliquely subtorulose 42. **Cajanus**
Slender twiner ; flowers paired in the leaf-axils ; fruits septate between the seeds 43. **Atylosia**
Ovules 2 :
Fruits compressed :
Weak twiners or trailers with usually slender racemes of flowers 44. **Rhynchosia**
Stems erect, mostly short, with spike-like racemes of flowers 45. **Eriosema**
Fruits turgid ; erect shrub with broad unifoliolate leaves ; flowers solitary or paired 46. **Flemingia**

Leaves not gland-dotted below :
Keel spirally twisted :
Style hooded at the apex ; axis of raceme with swollen nodes ; seeds with one side nearly straight .. .. 47. **Physostigma**
Style not hooded at the apex .. .. 48. **Phaseolus**
Keel not twisted :
Vexillary stamen free from the base upwards :
Bracts persistent, large :
Style bearded along the inner face ; leaves pinnate or trifoliolate 49. **Clitoria**
Style glabrous ; leaves trifoliolate .. .. 50. **Shuteria**
Bracts small and deciduous :
Keel longer than the standard petal ; fruits hispid with stinging hairs ; flowers in zigzag or short racemes or more or less umbellate .. .. 51. **Mucuna**
Keel shorter than the standard petal :
Fruits ripening above the ground :
Style glabrous :
Calyx entire or unilateral and irregularly and jagged-lobate ; trees or shrubs with large showy flowers ; petals unequal, the standard much exceeding the wings and keel .. .. 52. **Erythrina**
Calyx more or less regularly lobed ; petals subequal in length :
Nodes of raceme swollen .. .. 53. **Galactia**
Nodes of raceme not swollen .. .. 54. **Glycine**
Style bearded on one side or around the stigma :
Stigma lateral :
Stigma flat and broad, more or less spathulate .. .. 55. **Sphenostylis**
Stigma not flattened, narrow, style with a lateral beard of hairs 56. **Vigna**
Stigma terminal, surrounded by a ring of hairs :
Leaves not glandular below .. .. 57. **Dolichos**
Leaves gland-dotted below .. ..58. **Adenodolichos**
Style bearded ; calyx with short broad teeth.. .. .. 59. **Voandzeia**
Style glabrous ; calyx deeply divided with narrow segments

Fruits ripening below the ground : 60. **Kerstingiella**
Vexillary stamen connate in the upper part with the others, free below :
Fruits 4-winged, 5-6-seeded ; leaves 3-1-foliolate .. .. 61. **Psophocarpus**
Fruits not winged :
Fruits many-seeded ; herbaceous twiners :
Nodes of raceme not swollen .. .. 62. **Teramnus**
Nodes of raceme swollen .. .. 63. **Canavalia**
Fruits 1-3-seeded ; nodes of raceme swollen ; woody climber .. .. 64. **Dioclea**

Tribe IX.—VICIEAE

Woody slender twiners with pinnate leaves, the rhachis ending in a bristle ; stamens 9, connate in a sheath ; flowers racemose .. .. 65. **Abrus**

Tribe X.—HEDYSAREAE

Leaflets not stipellate :
Stamens monadelphous :
Pods not ripening beneath the soil
Leaflets 3 ; calyx-tube resembling a stalk ; stipules forming a sheath 66. **Stylosanthes**
Leaflets 2 or 4 ; calyx-tube not like a stalk ; stipules appendaged .. 67. **Zornia**
Pods ripening beneath the soil ; leaflets 2 pairs, without a terminal one ; flowers axillary, solitary .. .. 68. **Arachis**
Stamens diadelphous :
Calyx subregularly 5-toothed :
Fruits not circinately coiled :
Stamens in 2 bundles of 5 each ; shrubs or small trees 69. **Ormocarpum**
Stamens with 1 free and the rest connate ; a slender herb .. 70. **Ornithopus**
Fruits circinately coiled ; small pithy shrub with prickly branches ; flowers few, racemose, showy .. .. 71. **Herminiera**
Calyx bilabiate :
Fruits well exserted from the calyx :
Fruits straight or bent .. .. 72. **Aeschynomene**
Fruits coiled in a ring .. .. 73. **Cyclocarpa**
Fruits enclosed by the calyx :
Flowers not hidden by the bracts, the latter not reniform .. 74. **Smithia**
Flowers hidden by the large imbricate reniform bracts .. .. 75. **Geissaspis**
Leaves stipellate :
Fruits not bent backwards, more or less straight and exserted from the calyx :
Calyx herbaceous ; fruits compressed :
Leaf-rhachis not winged ; alternate filaments not flattened .. 76. **Desmodium**
Leaf-rhachis broadly winged, wing foliaceous ; alternate filaments flattened 77. **Droogmansia**
Calyx dry and glumaceous ; fruits not compressed .. .. .. 78. **Alysicarpus**
Fruits bent backwards, included in the calyx .. .. 79. **Uraria**

1. SWARTZIA Schreb.—F.T.A. 2 : 256.

A tree ; branchlets, leaf-rhachis and flowers softly tomentose ; leaflets alternate or opposite, lanceolate to elliptic, obtuse or emarginate, 3–7 cm. long, 1·5–4·5 cm. broad, closely reticulate above, thinly pubescent below ; flowers few in short racemes ; pedicels up to 4 cm. long, tomentose ; calyx globose in bud, finally splitting to the base and spreading or reflexed ; petal 1, orbicular, about 2·5 cm. broad, shortly clawed, densely villous outside ; stamens numerous, free ; anthers unequal, oblong ; ovary shortly stipitate ; fruit up to 30 cm. long, cylindrical, glabrous, black ; seeds numerous .. .. *madagascariensis*

S. madagascariensis *Desv.*—F.T.A. 2 : 257 ; Holl. 2 : 248 ; Chev. Bot. 218. A tree 20–30 ft. high, with conspicuous white sweetly scented flowers, and pods rather like those of *Cassia Areneh* but not splitting.
French Sudan : Bougouni (Apr.) ! Gambia ! French Guinea : Kouroussa (Apr.) ! Dahomey : Atacora Mts. N. Nigeria : common from Nupe and the Benue northwards in savannah ! All over tropical Africa and the Mascarene Islands. Exsicc.—*E. Vogel* 95. *Barter* 1596 ; 1849. *Dalz.* 4 ; 531. *Pobéguin* 185. (See Appendix).

2. CORDYLA Lour.—F.T.A. 2 : 257.

A tree ; leaflets opposite or subopposite, about 9–10 pairs, ovate, obtuse, 5–6 cm. long, 2–2·5 cm. broad, glabrous or slightly pubescent, often glaucous ; rhachis and petiolules pubescent ; flowers in rather dense softly woolly-tomentose racemes up to about 8 cm. long ; pedicels about 1 cm. long ; calyx closed in bud, at length splitting into

FIG. 141.—SWARTZIA MADAGASCARIENSIS *Desv.* (PAPILIONACEAE).

A, flowering shoot. B, flower. C, stamen. D, longitudinal section of ovary. E, fruiting shoot. F, transverse section of ovary. G, seed.

4–5 lobes; petals none; stamens numerous, nearly free; ovary long-stipitate, glabrous, multiovulate; fruit stipitate, ellipsoid, about 5 cm. long, 2–3-seeded *africana*

C. africana *Lour.*—F.T.A. 2 : 257; Chev. Bot. 219. *Calycandra pinnata* A. Rich. in Guill. & Perr. Tent. Fl. Seneg. 31, t. 9. A large tree sometimes 12 ft. in girth, with corky bark, grey pubescent branchlets, pale foliage and white or yellowish flowers (stamens but no petals, mostly on the older twigs); chiefly in open savannah.
French Sudan: Diondiou. Senegal: Kaolak, etc.! Casamance, Sedhiou (Feb.)! Gambia: common! Togo: Bunguna, Basari! N. Nigeria: Abinsi! Extends to East Africa and south to Natal. Exsicc.—*Heudelot* (no number). *Brown-Lester* 70. *Dalz.* 705; 8029. *Kersting* A. 517. (See Appendix).

3. BAPHIOPSIS Benth.—F.T.A. 2 : 256.

A tree; leaves unifoliolate, broadly elliptic or ovate-elliptic, obtusely acuminate, 9–20 cm. long, 4–10 cm. broad, closely reticulate on both surfaces, glabrous; lateral nerves 5–6 pairs; petiolule 1–4 cm. long, pulvinate and transversely rugose at each end; flowers in very short axillary racemes; axis of inflorescence up to 2·5 cm. long, slender, shortly pubescent; pedicels up to 1 cm. long, slightly pubescent; buds broadly ellipsoid, hairy at the tip, about 3·5 mm. long; calyx closed in bud, at length

FIG. 142.—FRUITS OF PAPILIONACEAE.

A, SOPHORA OCCIDENTALIS *Linn.* B, ANGYLOCALYX OLIGOPHYLLUS *Bak. f.* C, AFRORMOSIA LAXIFLORA *Harms.* D, HAPLORMOSIA MONOPHYLLA *Harms.* E, CORDYLA AFRICANA *Lour.* F, seed of same.

splitting irregularly; petals 6, about as long as the calyx, subequal; stamens 16–18, short, free; ovary sessile, 2-ovuled; fruits not known .. .. .. *parviflora*

B. parviflora *Benth.*—F.T.A. 2 : 256. Tree 40–50 ft. high; calyx green; corolla white.
S. Nigeria: Ambas Bay (Jan.)! Exsicc.—*Mann* 715.

4. SOPHORA Linn.—F.T.A. 2 : 253.

Small shrub, covered with short white indumentum; leaves imparipinnate; leaflets about 7 pairs, opposite or alternate, elliptic, rounded at each end, about 4 cm. long and 2 cm. broad, shortly appressed-tomentellous below; racemes up to 25 cm. long; bracts linear-subulate, 6 mm. long; pedicels up to 1 cm. long; calyx cupular, nearly 1 cm. long, minutely tomentellous; corolla 1·5–2 cm. long; fruits long-stipitate, torulose, about 15 cm. long, minutely tomentellous .. .. .. *occidentalis*

occidentalis *Linn.* Syst. ed. 10 : 1015. *S. nitens* Schum. & Thonn. *S. tomentosa* Bak.—F.T.A. 2 : 254, partly (as to W. African plant). A maritime shrub with hoary foliage, yellow flowers and beaded fruits.
Liberia: Cape Palmas (July)! Gold Coast: Axim! Sekondi! Togo: Lome! S. Nigeria: Lagos (Apr.)! Also in St. Thomas Island, West Indies and E. Trop. S. America. Exsicc.—*T. Vogel* 1. *Johnson* 969. *Chipp* 166. *Dalz.* 1367. *Warnecke* 213. (See Appendix).

5. ANGYLOCALYX Taub. in Engl. Bot. Jahrb. 23 : 172 (1896).

Standard petal not recurved, enfolding the narrow wings and keel; flowers subuniform in colour; leaves pinnate; leaflets alternate, about 3–7, ovate, very long-acuminate,

rounded or shortly cuneate at the base, the terminal one the largest, up to 23 cm. long and 9 cm. broad, glabrous; lateral nerves about 5 pairs; flowers in short racemes on the old wood, becoming reflexed and about 3 cm. long; calyx tubular, shortly lobed, about 1 cm. long; ovary shortly tomentose; fruit more or less torulose, glabrous, up to 11 cm. long, long-beaked .. .. .. 1. *oligophyllus*

Standard recurved in flower; flowers mauve, spotted with crimson; leaflets oblong-elliptic to obovate; other characters as above .. .. 2. *Talbotii*

1. **A. oligophyllus** *Bak. f.* in Cat. Talb. Nig. Fl. 26. *A. trifoliolatus* Bak. f. *A. ramiflorus* Taub. *Sophora oligophylla* Bak.—F.T.A. 2 : 254. Tree with smooth olive-green bark and glabrous branchlets; flowers red or light purple.
S. Nigeria; Epe! Lagos, Ikoyi (Feb., Mar., Oct.)! Lagos Colony, in forests! Ajilite! Oban! Abeokuta! Degema! Eket! Calabar (fl. and fr. Feb., Mar.)! Cameroons Mt.: Tiko (Jan.)! Between Victoria and Bota (Mar.). Also in French Cameroons. Extends to Angola. Exsicc.—*Barter* 3313. *Mann* 2232. *Moloney*. *Millen* 175; 199. *Talb.* 3151; 3378. *Unwin* 77. (See Appendix).
2. **A. Talbotii** *Bak. f.*, ined.
S. Nigeria: Oban! Exsicc.—*Talb.* 1205.

6. AFRORMOSIA Harms in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 3 : 158 (1906).

A tree; branchlets and leaf-rhachis shortly pubescent; leaves imparipinnate; leaflets alternate or opposite, stipellate, variable in shape from narrowly lanceolate to broadly ovate-elliptic, acute to subcordate at the base, shortly acuminate and emarginate at the apex, 4–10 cm. long, 1·5–4·5 cm. broad, slightly pubescent to nearly glabrous below; petiolules about 5 mm. long, pubescent; stipels subulate; flowers paniculate, panicles about ½ as long as the leaves; bracts and bracteoles deciduous; pedicels about 1 cm. long, softly pubescent; calyx 1 cm. long, 5-lobed to below the middle, shortly pubescent; petals 5; stamens 10, free; fruit linear-oblong, flat, thin, usually 1–3-seeded, up to 15 cm. long and 3 cm. broad, with a faint intramarginal nerve .. .. *laxiflora*

A. laxiflora *Harms* l.c., and in Engl. Pflanzenw. Afr. 3, 1 : 527, t. 278; Chev. Bot. 218. *Ormosia laxiflora* Benth.—F.T.A. 2 : 255; Holl. 2 : 248; Chev. Bot. 218. A tree 30–40 ft. high, with usually tortuous stem and red or yellow-blotched bark, grey-pubescent branchlets and greenish-white or cream flowers.
Fairly common throughout the area, chiefly in savannah, often on rocky ground, sometimes in fringing forest; extending to E. Sudan. Exsicc.—*Barter* 1622. *Mann* 2203. *Sc. Elliot* 5246; 5302. *Poéguin* 663. *Kersting* 6; A. 324. *Chev.* 23565; 24786. (See Appendix).

7. AMPHIMAS Pierre *ex* Dalla Torre & Harms, Gen. Siphonog. 220, name only; Harms in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 3 : 157 (1906).

Branchlets stout, rusty-tomentellous; leaflets 5–6 pairs, opposite or subopposite, lanceolate to narrowly obovate, rounded or broadly acuminate and mucronate, 6–12 cm. long, 2–3·5 cm. broad, glabrous, with rather numerous slender lateral nerves; stipels filiform, about 7 mm. long; panicles bracteate; bracts ovate, acuminate, about 7 mm. long, tomentellous; fruits flat, oblong-elliptic, 15–18 cm. long, 4–6 cm. broad, the body lanceolate and reticulate, surrounded by a smooth wing about 2 cm. broad; seed solitary, reniform, about 2 cm. broad .. .. *pterocarpoides*

A. pterocarpoides *Harms* in Fedde Repert. 12 : 12. A tall forest tree with cylindrical stem and spreading crown, and papery fruits.
French Guinea: Kissidougou (fr. Feb.)! Gold Coast: W. Ashanti, Insuta (fr. Jan.)! Also in South Cameroons. Exsicc.—*Chipp* 62. *Chev.* 20716.

8. HAPLORMOSIA Harms in Engl. Pflanzenw. Afr. 3, 1 : 532 (1915), and in Fedde Repert. 15 : 23 (1919).

A tree; branchlets glabrous, purplish; leaves simple (unifoliolate), broadly elliptic, shortly and obtusely acuminate, rounded or shortly cuneate at the base, 7–18 cm. long, 3·5–9 cm. broad, glabrous; lateral nerves about 6–8 pairs; petiole 2–3·5 cm. long; racemes lateral, few-flowered, up to 10 cm. long; pedicels 1 cm. long, with a pair of small bracteoles at the top; calyx glabrous outside except the margins of the 5 lobes; petals 5; stamens 10, free; fruit flat, obovate-elliptic, beaked, about 8 cm. long and 4–5 cm. broad, glabrous, 1-seeded .. .. *monophylla*

H. monophylla *Harms* ll.cc. *Ormosia monophylla* Harms ex Stapf in Johnston, Liberia 2 : 598. *Crudia monophylla* Harms; Chev. Bot. 233. A shrub or medium-sized tree with blue flowers and short woody pods.
Sierra Leone: Falaba (Apr.)! Sherboro! Liberia: Grand Bassa, by mangrove swamps! Ivory Coast: Bingerville! Abidjean! Dabou! S. Nigeria: Epe! Oni, along the creeks! Eket! Also in French Cameroons. Exsicc.—*Barter* 3269. *Dinklage* 1912; 1913. *Aylmer* 33. *Talb.* 3291. *Sankey* 15. *Chev.* 15420; 17349. (See Appendix).

9. LEUCOMPHALUS Benth.—F.T.A. 2 : 251.

A shrub; leaves unifoliolate, ovate-elliptic, obtusely acuminate, rounded at the base, 5–10 cm. long, 3·5–5 cm. broad, papery, glabrous, closely reticulate on both surfaces, with about 5 pairs of lateral nerves; petiolule up to 3 cm. long, subterete; flowers in short axillary racemes towards the ends of the branches; axis of inflorescence pubescent, about 2 cm. long; pedicels 3–4 mm. long, puberulous; buds ovoid, 6 mm. long, glabrous; petals subequal; anthers longer than the filaments; fruits dehiscent,

obliquely elliptic, beaked, 2–3 cm. long, stipitate, 1-seeded; seeds with a spongy aril .. .. *capparideus*

L. capparideus *Benth.* in Hook. Fl. Nig. 322, t. 31—F.T.A. 2 : 251. A shrub slightly branched from the base; petals and fruit white; seeds with a large white aril.
S. Nigeria: Oban! Fernando Po (Dec.)! Extends to Gabon. Exsicc.—*T. Vogel* 264. *Talb.* 1208.

10. BAPHIA Afzel.—F.T.A. 2 : 247; Lester-Garland in Journ. Linn. Soc. Bot. 45 : 221 (1921).

Calyx divided into two subequal parts:
Branchlets and midrib shortly puberulous; inflorescence often branched towards the base; leaves oblong-elliptic, rather long-acuminate, rounded or subcordate at the base, up to 14 cm. long and 7 cm. broad, slightly pubescent below; fruits linear, about 12 cm. long and 1·5 cm. broad, glabrous .. .. .. 1. *polygalacea*
Branchlets and midrib densely rusty-tomentose; inflorescence not branched, 5–7 cm. long; leaves oblong-lanceolate, shortly acuminate, rounded at the base, 7–11 cm. long, 2·5-4 cm. broad, hirsute on both surfaces on and towards the midrib; pedicels 5–7 mm. long; calyx 1 cm. long .. .. 2. *Heudelotiana*
Calyx split down one side only (spathaceous):
Flowers in racemes, arranged singly on the axis:
Bracteoles oblong, nervose, about 2 mm. long; leaves ovate or oblong-elliptic, long-acuminate, subcordate at the base, 9–20 cm. long, 4–6 cm. broad, glabrous, closely reticulate below; racemes axillary; pedicels nearly 1 cm. long; calyx about 7 mm. long; ovary tomentose .. .. 3. *leptobotrys*
Bracteoles short and cupular; leaves elliptic, abruptly obtusely acuminate, rounded at the base, 8–13 cm. long, 4·5–6·5 cm. broad, glabrous and finely reticulate below; pedicels 6–10 mm. long; racemes on the old wood, up to 20 cm. long; calyx 8 mm. long .. .. 4. *obanensis*
Flowers in axillary fascicles or solitary, or if apparently racemose (by falling of the leaves) then racemes terminal and pedicels fasciculate:
Ovary glabrous:
Pedicels shorter than the petioles; bracteoles free, ovate, short, more or less tomentellous, deciduous; calyx slightly pubescent in the upper part, about 1 cm. long; leaves oblong-elliptic to ovate, acuminate, rounded at the base, 8–12 cm. long, 4–5 cm. broad, more or less pubescent on the nerves below; petiole 1·5–2 cm. long; fruits oblanceolate, up to 15 cm. long, glabrous .. .. .. 5. *nitida*
Pedicels much longer than the petiole, slender; bracteoles forming a short membranous cup; calyx 1·3 cm. long, glabrous; leaves oblong-lanceolate, gradually acuminate, shortly cuneate at the base, 5–8 cm. long, 1·5–2·5 cm. broad, glabrous except on the midrib .. .. 6. *angolensis*
Ovary tomentose:
Leaves rather long-caudate-acuminate, oblong-elliptic and oblong-obovate:
Leaves very acutely acuminate, acumen mucronate, permanently and thinly pubescent below and strongly reticulate, oblong-elliptic, rounded at the base, 8–10 cm. long, 3–4 cm. broad; lateral nerves about 6 pairs; petiole 1·3 cm. long, thinly pubescent; calyx about 1·5 cm. long, appressed-tomentellous; ovary tomentose .. .. 7. *spathacea*
Leaves obtusely acuminate, acumen not mucronate:
Leaves glabrous below from the beginning except the midrib; pedicels 1·5–2 cm. long in the opening flower, stiff, tomentose; leaf-blade oblong-elliptic, 8–15 cm. long, 4–7 cm. broad, finely reticulate, leathery; petiole about 5 mm. long; calyx about 1 cm. long; bracteoles small and cup-shaped .. 8. *laurifolia*
Leaves softly pubescent below, often early becoming glabrescent; pedicels up to 1 cm. long; leaf-blade oblong to obovate-elliptic, 6–12 cm. long, 3–5 cm. broad; lateral nerves 8–9 pairs; petiole 5–10 mm. long; calyx up to 1 cm. long, rusty-tomentellous or at length glabrescent; fruits oblanceolate, about 8 cm. long, glabrous, 1–3-seeded .. .. 9. *pubescens*
Leaves hardly or only shortly and rather gradually acuminate, mostly broadly elliptic or suborbicular:
Leaves suborbicular or very broadly elliptic, shortly cordate at the base, about 12 cm. long and 8 cm. broad, shortly pubescent on the nerves below; lateral nerves 6–7 pairs; petiole 4–5 cm. long, nearly glabrous; bracteoles broadly ovate, 8 mm. long, tomentellous; calyx 1·4 cm. long; pedicels stout, 1 cm. long; ovary villous .. .. 10. *orbiculata*
Leaves at most broadly elliptic, rounded at the base:
Petiole $\frac{1}{5}$–$\frac{1}{8}$ as long as the leaf-blade; flowers in a terminal panicle:
Pedicels as long as the calyx; bracteoles fairly large, about $\frac{1}{2}$ as long as the calyx; leaves broadly elliptic, acutely and shortly acuminate, 10–18 cm. long, 6–8 cm. broad, reticulate and minutely rusty-pubescent below; lateral nerves 6 7 pairs; petiole 2 3 cm. long, pubescent; fruit club-shaped, bent, 1-seeded, about 4 cm. long, tomentose .. .. 11. *confusa*

Pedicels $\frac{1}{4}$–$\frac{1}{2}$ as long as the calyx; bracteoles very short and inconspicuous; leaves oblong-ovate, obtusely acuminate, rounded at the base, 6–8 cm. long, 3–4 cm. broad, minutely pubescent below; lateral nerves 7–8 pairs, nearly glabrous .. .. 12. *Dinklagei*

Petiole about $\frac{1}{2}$ as long as the leaf-blade; flowers mainly axillary; leaves broadly oblong-elliptic, broadly rounded at the base, shortly triangular-acuminate, up to 18 cm. long and 12 cm. broad, slightly puberulous on the nerves below; bracteoles broadly ovate; calyx 1·5 cm. long, softly tomentose; fruits oblanceolate, 11–12 cm. long, glabrescent, with a thickened margin

13. *maxima*

1. **Baphia polygalacea** *Bak.*—F.T.A. 2 : 248; Lester-Garland l.c. 228; Stapf 598; Chev. Bot. 217. *B. leptobotrys* var. *nigerica* Bak. f. A shrub or small tree, sometimes scandent; flowers rather small, with a silky calyx and white standard with a yellow spot, in copious short racemes or panicles.
   Sierra Leone to Ivory Coast, common! S. Nigeria: Eket! Calabar and Cross River district, common! Oban! Fernando Po! Extends to the Congo. Exsicc.—*G. Don. T. Vogel* 46. *Barter* 2071. *Kirk. Mann* 184; 396; 2250. *Thomson* 58. *Sc. Elliot* 4236; 5469; 5544; 5796. *Whyte. Talb.* 1554. (See Appendix).
2. **B. Heudelotiana** *Baill.*—F.T.A. 2 : 249; Lester-Garland l.c. 229. An erect shrub 12–20 ft. high, with white flowers in rusty-tomentose racemes.
   Senegal: Rio Pongos! Exsicc.—*Heudelot* 898.
3. **B. leptobotrys** *Harms* in Engl. Bot. Jahrb. 26 : 282; Lester-Garland l.c. 232. *B. silvatica* Harms. A glabrous shrub, sometimes more or less scrambling.
   S. Nigeria: Oban! Tiko (Jan.)! Also in French Cameroons. Exsicc.—*Talb.* 591; 1761. *Dunlap* 166.
4. **B. obanensis** *Bak. f.* in Cat. Talb. Nig. Pl. 25. A tree about 30 ft. high; flowers white with a yellow base.
   S. Nigeria: Oban! Exsicc.—*Talb.* 1682.
5. **B. nitida** *Lodd.*—F.T.A. 2 : 249; Lester-Garland l.c. 230; Holl. 2 : 246; Chev. Bot. 216. *B. barombiensis* Taub. A shrub or small tree up to 30 ft. high, with usually glabrous branchlets; flowers usually 1–4 together (occasionally crowded), fragrant, white with a yellow centre.
   Throughout the area in the coastal forests and to a less extent in the interior, often planted as a dye-wood. Also in French Cameroons. (See Appendix).
6. **B. angolensis** *Welw.* ex *Bak.*—F.T.A. 2 : 249; Lester-Garland l.c. 230. A shrub or small tree up to 20 ft. high, nearly glabrous, with fairly large white flowers.
   Liberia: Mt. Barclay! Extends to Angola and N.W. Rhodesia. Exsicc.—*Bunting* 28.
7. **B. spathacea** *Hook. f.*—F.T.A. 2 : 250; Stapf 598; Lester-Garland l.c. 238.
   Liberia: Bassa Cove! Exsicc.—*Ansell.*
8. **B. laurifolia** *Baill.* Adans. 6 : 213. *B. crassifolia* Harms l.c. 280; Lester-Garland l.c. 234. *B. myrtifolia* Lester-Garland. *B. densiflora* Lester-Garland, partly, not of Harms. *B. glauca* A. Chev. Bot. 216? A shrub up to 20 ft. high; inflorescence rusty-tomentose, flowers white, fairly large, 3–7 together in the leaf-axils, or apparently paniculate by fall of the leaves.
   S. Nigeria: Oban! Eket! Extends to the Belgian Congo. Exsicc.—*Talb.* 1718; 1719.
9. **B. pubescens** *Hook. f.*—F.T.A. 2 : 250; Lester-Garland l.c. 235; Holl. 2 : 247; Chev. Bot. 217. A shrub or tree about 20 ft. high, with brown-tomentose branchlets and inflorescence; flowers white with a yellow streak, sweet-scented.
   Ivory Coast: Middle Comoé, between Bébou and Mbasso (Dec.)! Danané (June)! Gold Coast: Kumasi! Fwirem (May)! Popokyere (Apr.)! Dunkwa (June)! Accra Plains (Mar., Apr.)! E. Akim (Mar.)! Togo! Dahomey: near Porto Novo. N. Nigeria: Dekina (June)! Gurara R. (July)! S. Nigeria: Lagos (Mar., May, Nov.)! Agege! Onitsha! Benin, Idio R. (June)! Extends to the Congo. Exsicc.—*T. Vogel* (no number). *Barter* 1617. *Johnson* 718. *Farmar* 539. *Elliott* 177; 246. *Millen* 76. *Foster* 219. *Baumann* 15. (See Appendix).
10. **B. orbiculata** *Bak. f.* in Cat. Talb. Nig. Pl. 25; Lester-Garland l.c. 238. A tree about 25–40 ft. high, with leathery leaves; flowers in axillary fascicles, white with yellow streaks and a thick yellow-tomentose calyx.
    S. Nigeria: Oban! Exsicc.—*Talb.* 23 bis; 1557.
11. **B. confusa** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *B. spathacea* Bak.—F.T.A. 2 : 250, partly, not of Hook. f. A tree 20–25 ft. high or sometimes lax and subscandent; branchlets shortly rusty when young; flowers crowded in few-flowered fascicles, brown-tomentose.
    S. Nigeria: Onitsha! Uzi (Feb.)! Degema! Calabar (Aug.)! Oban! Cameroons River (Jan.)! Fernando Po (Jan.)! Also in French Cameroons. Exsicc.—*Mann* 216; 746; 2219. *Barter* 2063. *Holland* 22. *Williams* 12. *Thomas* 2336. *Unwin* 82. *Talb.* 1331; 1555; 3729.
12. **B. Dinklagei** *Harms* in Engl. Bot. Jahrb. 26 : 279; Lester-Garland l.c. 235; Stapf 598 (under *B. spathacea* Hook. f., partly). A shrub 6–15 ft. high, with nearly glabrous branchlets; flowers fairly large, yellowish-white with rusty-velvety calyx, 2–6 together in the leaf-axils, appearing paniculate by fall of the leaves.
    Liberia: Grand Bassa, in thickets on the foreshore! Exsicc.—*Dinklage* 1664.
13. **B. maxima** *Bak.*—F.T.A. 2 : 250; Lester-Garland l.c. 238. *B. longipetiolata* Taub. An erect shrub 10–12 ft. high, with yellowish-tomentose branchlets and inflorescence; corolla white, nearly 1 in. long.
    S. Nigeria: Cameroons River (fl. and fr. Jan.)! Also in French Cameroons. Exsicc.—*Mann* 2224.

11. DALBERGIA Linn.—F.T.A. 2 : 231.

Leaflets more or less pointed to acutely acuminate, up to 6 on each side of the rhachis: Terminal leaflet much larger than the others, broadly obovate-elliptic, 9–15 cm. long, 5–6·5 cm. broad, all the leaflets densely pubescent on the midrib below; branchlets brown-tomentose; flowers rather crowded in the leaf-axils; stipules broadly lanceolate, leafy; fruits narrowly oblong, rounded at both ends, shortly stipitate, 6–9 cm. long, 1·5–2 cm. broad, glabrous and laxly reticulate, 1–3-seeded 1. *Dalzielii*

Terminal leaflet only slightly larger than the others, more or less narrowly oblong: Leaflets ending in a setose point; branchlets softly villous with reflexed hairs; lower leaflets ovate, uppermost oblong or oblong-elliptic, rounded at the base, up to 8 cm. long and 2·5 cm. broad, pubescent with spreading hairs beneath; stipules lanceolate, acuminate, about 1 cm. long; inflorescence axillary, very short

2. *setifera*

Leaflets at most acute; branchlets not villous: Branchlets glabrous; leaflets shortly cuneate at the base, the terminal one up to

7 cm. long and 3 cm. broad, oblong to obovate, obtusely acuminate, slightly pubescent below; inflorescence axillary, very short; calyx puberulous 3. *oligophylla*

Branchlets shortly pubescent; leaflets rounded at the base, the terminal one up to 4·5 cm. long and 2 cm. broad, oblong, mucronate, shortly pubescent below; inflorescence very few-flowered, much shorter than the leaves; calyx tomentellous; fruits oblong, rounded at both ends, about 8 cm. long and 2 cm. broad, shortly stipitate, appressed-pubescent .. .. 4. *oblongifolia*

Leaflets rounded to emarginate or apiculate at the apex:

Stamens connate into 1 bundle:

Leaflets broadly obovate-elliptic, about 3 pairs, about 1½ times as long as broad, 3·5–5 cm. long, 2–3·5 cm. broad, pubescent below, with 6–8 pairs of prominent lateral nerves, conspicuously apiculate; flowers small, crowded in a panicle, pubescent .. .. 5. *albiflora*

Leaflets oblong to obovate, 8–9 pairs, about 2½ times as long as broad, rounded at the apex, up to 4 cm. long and 2 cm. broad, nearly glabrous; flowers numerous, very small in pedunculate cymes; calyx minutely pubescent outside; fruits oblong, cuneate at the base, 3–3·5 cm. long, flat, 1–2-seeded, glabrous 6. *hostilis*

Stamens connate into 2 bundles of 5 each:

Calyx-tube strongly ribbed and minutely pubescent; fruits large, broadly oblong, about 10 cm. long and 3·5 cm. broad, 1-seeded, glabrous, slightly reticulate on the seed; leaflets about 9 on each side, oblong, truncate or widely emarginate at the apex, 1–1·5 cm. long, about 6 mm. broad, slightly pubescent below; flowers few in simple racemes .. .. 7. *Afzeliana*

Calyx-tube not ribbed or only slightly so and then glabrous:

Branchlets not spiny:

Leaflets pubescent below:

Leaflets 2–3 times as long as broad:

Fruits large, flat, oblong-elliptic, up to 15 cm. long and 4 cm. broad, laxly reticulate, glabrous, 1–2-seeded; leaflets 5–6 on each side, oblong-elliptic, rounded and often emarginate at the apex, up to 6 cm. long and 3·5 cm. broad, slightly pubescent below; flowers in a loose panicle; calyx-tube slightly ribbed, glabrous or slightly pubescent .. .. .. 8. *saxatilis*

Fruits up to 6 cm. long and 3 cm. broad; leaflets 6–10 on each side, the lateral ones oblong, the terminal obovate, up to 4 cm. long and 2 cm. broad, rather densely pubescent below; stipules obovate, subpersistent, 6–8 mm. long; flowers crowded; calyx shortly pubescent .. .. 9. *rufa*

Leaflets about 3–4 pairs, nearly as broad as long, very broadly elliptic or suborbicular, subcordate at the base, 3–4·5 cm. long, 2·5–3·5 cm. broad, with about 9 pairs of lateral nerves, thinly pubescent below; rhachis pubescent; flowers in very small cymes; calyx-tube rusty-pubescent .. 10. *ajudana*

Leaflets quite glabrous below, oblong, rounded at both ends, 3–5 cm. long, 1·5–2·5 cm. broad, glaucous below, with 5–6 pairs of lateral nerves; flowers in rather dense terminal panicles; pedicels and calyx brown-tomentellous 11. *Preussii*

Branchlets ending in spines, grey; fruits small, pointed at both ends, 1–4-seeded, up to 5 cm. long and 1·5 cm. broad, laxly reticulate, glabrous; leaflets 4–6 on each side, obovate-elliptic, truncate and emarginate at the apex, 1–3·5 cm. long, 1–2 cm. broad, becoming strongly nerved, laxly pubescent below; flowers in lax panicles; calyx-tube very slightly pubescent .. .. .. 12. *melanoxylon*

1. **Dalbergia Dalzielii** *Bak. f.*, ined. A shrub, erect or half climbing, with densely clustered rather small white flowers.
S. Nigeria: Lagos, Ikoyi Plains (Jan., Feb.)! Ebute Metta (Jan.)! Bonny (Feb.)! extending to French Cameroons. Exsicc.—*Dalz.* 1220; 1368. *Millen* 95. *Kalbreyer* 55.
2. **D. setifera** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A shrub, rusty-villous on the young parts, with short clustered racemes of small white flowers.
Gold Coast: ? locality! Exsicc.—*Evans* 24.
3. **D. oligophylla** *Baker* ex *Hutch. & J. M. Dalz.* l.c. *D. Bakeri* Baker.—F.T.A. 2: 235, partly, not of Welw. A shrub 25 ft. high.
Cameroons Mt., 5,000 ft. Exsicc.—*Mann* 2172.
4. **D. oblongifolia** *G. Don* in Gen. Syst. 2: 375. *D. Dinklagei* Harms in Engl. Bot. Jahrb. 26: 293; Stapf 596; Chev. Bot. 210. A densely branched shrub with short clusters of white flowers and rusty flat pods.
Sierra Leone! Liberia: Grand Bassa, in thickets on grassy plains (Aug., Oct.)! banga (Sept.)! Moala (Nov.)! Ivory Coast: Indénié, at Zaranou (Mar.)! Exsicc.—*Afzelius. Dinklage* 1724; 1987; 2098; *Linder* 526; 1371.
5. **D. albiflora** *A. Chev.* Bot. 210, name only. Apparently a climbing shrub, with rusty-pubescent branchlets and inflorescence.
Ivory Coast: Middle Sassandra, between Soubré and Péhiri (June)! Exsicc.—*Chev.* 19175.
6. **D. hostilis** *Benth.*—F.T.A. 2: 232. A shrub, climbing or erect, with axillary spines sometimes clustered and copious rusty-pubescent inflorescence of small white flowers.
Ivory Coast: Dyola country, Mt. Kouan (Apr.)! Gold Coast: Abetifi (June)! S. Nigeria: Abeokuta! Onitsha Olona (fr. Oct.)! ? locality! Extends to Shari and Angola. Exsicc.—*Irving* 84. *Foster* 315. *Chev.* 21271. (See Appendix).

7. **D. Afzeliana** *G. Don*, Gen. Syst. 2 : 375. *D. Afzelii* Baker—F.T.A. 2 : 234. A hard-wooded climber, rusty-pubescent on the young branchlets and inflorescence.
French Guinea : Futa-Jallon, Boulivel (Sept.) ! Sierra Leone : ? locality ! Talla Hills, near Lumbaraya (fr. Feb.) ! Also in Gabon. Exsicc.—*Afzelius. Sc. Elliot* 4944. *Chev.* 18632.
8. **D. saxatilis** *Hook. f.*—F.T.A. 2 : 233 ; Stapf 596 ; Chev. Bot. 210. *D. saxatilis* vars. *Donii* and *Ansellii* Hook. f. A glabrous climbing or straggling shrub ; flowers white or pink, ¼ in. long, in loose axillary or terminal panicles.
French Guinea : Rio Nunez ! Konakry ! Kouria, Bilima and environs ! Sierra Leone : common ! Liberia : several localities ! Ivory Coast : Upper Sassandra, Toura country ! Gold Coast : Aburi Hills (Nov.) ! Anum (Jan.) ! Togo : Amedzofwe (Feb.) ! S. Nigeria : many localities ! Also in French Cameroons and Gabon. Exsicc.—*Heudelot* 596 ; 717. *Farmar* 148 ; 334. *Ansell. Barter* 1782 ; 2233. *Irving. Mann* 2251. *Millen* 12 ; 36 ; 86 ; 134. *Sc. Elliot* 4355. *Linder* 890. *Garrett* 5794 ; 5852. *Whyte. Talb.* 3106. *Caille* ex *Herb. Chev.* 14886. *Debeaux* 317. (See Appendix).
9. **D. rufa** *G. Don*, l.c. *D. pubescens* Hook. f.—F.T.A. 2 : 234 ; Chev. Bot. 210. *D. djalonensis* A. Chev. *D. lagosana* Harms. A lax-branched scrambling shrub, with fairly dense rusty-pubescent inflorescence of white flowers.
Senegal ! French Guinea : Futa Jallon, between the Konkouré and Timbo (Mar.) ! Mamou (Nov.) ! Ditinn (Mar.). Sierra Leone : various localities ! S. Nigeria : Lagos Colony ! Calabar ! Exsicc. —*Heudelot* 895. *Afzelius. Turner. Thomson* 27. *Moloney. Chev.* 14681.
10. **D. ajudana** *Harms* in Engl. Bot. Jahrb. 26 : 295. A shrub with rusty-pubescent branchlets and inflorescence.
Dahomey : Ajuda, on the banks of lagoons. Exsicc.—*Newton.*
11. **D. Preussii** *Harms* l.c. 294. A half-climbing shrub with glabrous branchlets.
Cameroons Mt. : Buea ! Exsicc.—*Preuss* 897.
12. **D. melanoxylon** *Guill. & Perr.* Tent. Fl. Seneg. 1 : 227, t. 53.—F.T.A. 2 : 233 ; Holl. 2 : 237 ; Chev. Bot. 210. A small tree up to 20 ft. high, much branched, glabrous, armed with woody spines which are the hardened tips of short branches often bearing leaves and flowers.
French Sudan : Mossi, from Yoko to Ouahigouya (fr. Aug.) ! Senegal : Kouma ! N. Nigeria : Katagum (fr. Sept.) ! Yola (Apr.) ! Extends to Abyssinia, East Africa south to Rhodesia, and in Angola. Exsicc.—*Heudelot. Lelièvre. Dalz.* 6 ; 34. (See Appendix).

12. ECASTAPHYLLUM P. Br.—F.T.A. 2 : 236.

Leaves 1-foliolate or very rarely 3-foliolate, ovate to oblong-elliptic, rounded at the base, shortly acuminate, up to 17 cm. long and 7 cm. broad, subglaucous and shortly pubescent below ; flowers in small dense axillary panicles ; fruits obovate-orbicular, flat, smooth, about 3 cm. in diam., minutely pubescent .. .. 1. *Brownei*
Leaves 3–7-foliolate, otherwise as above ; fruits obovate-semilunar, with one side straight, thick and bullate, about 4 cm. long and 2·5 cm. broad, tomentellous 2. *Heudelotii*

1. **E. Brownei** *Pers.*—F.T.A. 2 : 236 ; Chev. Bot. 211. *Dalbergia ecastaphyllum* Taub.—Stapf 596. A shrub, up to 20 or more ft. high, with dark purplish-black branchlets and small crowded panicles of white fragrant flowers.
Common in the coastal regions, especially in mangrove swamps, from Senegal to Fernando Po, and south to Angola ; also in West Indies and tropical America south to Brazil. Exsicc.—*Heudelot* 510 ; 905. *Sieber. T. Vogel* 5 ; 52 ; 81. *Mann* 262. *Barter* 1828. *Whyte. Sc. Elliot* 4134. *Talb.* 3093. *Preuss* 1303.
2. **E. Heudelotii** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Dalbergia Heudelotii* Stapf. *Ecastaphyllum monetaria* Baker—F.T.A. 2 : 236 ; Chev. Bot. 211, not of Pers. A shrub like the preceding.
French Guinea : Rio Nunez ! Sierra Leone : Pujehun (Apr.) ! Kennema ! Liberia : Grand Bassa, common in thickets on grassy plains (Aug.) ! S. Nigeria : Eket ! Also in French Cameroons. Exsicc.—*Afzelius. Heudelot* 623. *Sc. Elliot* 5626. *Aylmer* 64. *Macdonald* 479. *Dinklage* 1986. *Talb.* 3241.

13. PTEROCARPUS Linn.—F.T.A. 2 : 237.

Leaflets rounded at the apex, not acuminate or rarely shortly so ; fruit-body neither bristly nor verrucose ; inflorescence a simple raceme :
Inflorescence shorter than the leaves, 6–12-flowered ; leaflets 1–3, broadly ovate to suborbicular, emarginate at the apex, up to 7 cm. long and 5 cm. broad, closely reticulate, shining on the upper surface ; calyx subtruncate, about 6 mm. long, glabrous outside ; fruits obovate-elliptic, shortly stipitate, 4·5 cm. long, about 3 cm. broad, reticulate .. .. 1. *lucens*
Inflorescence longer than the leaves, with numerous flowers ; leaflets mostly 5–7, oblong or elliptic, emarginate at the apex, up to 7·5 cm. long and 3 cm. broad, closely reticulate and glabrous ; calyx distinctly lobed ; fruits obovate, stipitate, 4 cm. long, 2·5 cm. broad .. .. 2. *abyssinicus*
Inflorescence longer than the leaves, with numerous flowers ; leaflets 7–9, oblong-elliptic, shortly acuminate, 6–10 cm. long, 4–5 cm. broad, finely reticulate and glabrous ; calyx shortly lobed, glabrous ; bracts linear-lanceolate, 8–11 mm. long, puberulous ; fruits orbicular, very shortly stipitate, 8–9 cm. diam., glabrous 3. *Mildbraedii*
Leaflets more or less acuminate ; fruit-body bristly or verrucose and shortly pubescent ; inflorescence mostly branched :
Fruit-body bristly, broadly winged ; leaflets oblong or oblong-elliptic :
Fruits orbicular, 9–14 cm. in diam., the body shortly bristly ; leaflets mostly oblong, rounded at each end, shortly and abruptly acuminate, 7–14 cm. long, 3–5 cm. broad, slightly pubescent below ; branchlets with numerous short prickles ; flowers in lax panicles about as long as the leaves ; calyx tomentellous .. 4. *osun*
Fruits suborbicular, 4–7 cm. in diam., the body with long slender bristles ; leaflets mostly oblong-elliptic, gradually and very shortly acuminate, 6–11 cm. long, 3–6 cm. broad, rather closely and shortly pubescent below ; branchlets not prickly ; flowers precocious, in lax panicles ; calyx softly tomentellous .. 5. *erinaceus*

Fruit-body verrucose, very narrowly winged, tomentellous, 3–4 cm. diam., comparatively thick; leaflets ovate or ovate-elliptic or rarely oblong, rounded at the base, rather abruptly acuminate, 5–12 cm. long, 3–5·5 cm. broad, glabrous and closely reticulate below; branchlets not prickly; flowers in slender racemes; calyx tomentose .. .. 6. *santalinoides*

1. **Pterocarpus lucens** *Guill. & Perr.*—F.T.A. 2 : 238, partly; Holl. 2 : 240; Chev. Bot. 212. *P. simplicifolius* Baker. *P. lucens* var. *simplicifolius* A. Chev. Bot. 213. A small tree, up to 20–30 ft. high, with light yellow flowers.
French Sudan: Quiébélé (June)! Tacadji; Sansanding; Ouagadougou. Senegal: Bakel. N. Nigeria: Nupe! Kontagora (Apr.)! Exsicc.—*Barter* (no number). *Dalz.* 311. (See Appendix).
2. **P. abyssinicus** *Hochst.* *P. lucens* Baker.—F.T.A. 2 : 238, partly. A tree resembling the last.
N. Nigeria: Yola (Jan.)! Extends to E. Sudan and Abyssinia. Exsicc.—*Dalz.* 11.
3. **P. Mildbraedii** *Harms* in Notizbl. Bot. Gart. Berl. 8 : 152. A tree 40–50 ft. high, with glabrous branchlets and yellow flowers with conspicuous bracts; fruits membranous, large, flat and smooth.
S. Nigeria: Victoria Botanic Gardens (Nov.)! Also in French Cameroons and possibly (see Harms l.c.) in Dahomey. Exsicc.—*Deistel* 580.
4. **P. osun** *Craib* in Kew Bull. 1910 : 329; Holl. 2 : 241. A tree with comparatively short bole; branchlets brown-tomentellous and often bristly or prickly; flowers small, yellow.
S. Nigeria: Ibadan forests (fr. Dec.)! Mamu! Obubra (fr. Oct.)! Ikom (fr. Jan.)! Ibuzo (fr. Nov.)! Gambari (Oct.)! Exsicc.—*Holl.* 198. *Punch* 114. *Unwin* 35; 36; 37; 38. (See Appendix).
5. **P. erinaceus** *Poir.*—F.T.A. 2 : 239 (excl. syn. *P. omgolensis* DC. and *P. echinatus* DC.); Chev. Bot. 211;

FIG. 143.—PTEROCARPUS ERINACEUS *Poir.* (PAPILIONACEAE).
A, leaf. B, inflorescence. C, standard petal. D, fruits. E, fruit opened out.

Holl. 2 : 239; Engl. Pflanzenw. Afr. 3, 1 : 636, fig. 306. A tree up to 40–50 ft. high, often covered with golden-yellow flowers when quite leafless.
Common in open country and savannah forests, extending to Gabon and ? East Africa. Exsicc.—*Heudelot* 47; 373; 628. *Barter* 1190; 1628. *Sc. Elliot* 4776. *Rouland* 6. *Punch* 148. *Elliott* 19. *Krause. Pobéguin* 645. *Kersting* A. 223; A. 536. *Mildbraed* 7405. (See Appendix).
6. **P. santalinoides** *L'Hér.* ex *DC.* Prodr. 2 : 419. *P. esculentus* Schum. & Thonn.—F.T.A. 2 : 238; Stapf 597; Holl. 2 : 240; Chev. Bot. 212. A tree 30–40 ft. high, often with short or divided stem, shining foliage, and brilliant yellow flowers; usually evergreen but in some situations briefly deciduous.
A very common riverside tree, especially in mixed deciduous forests; from French Sudan and Senegal to British Cameroons. Exsicc.—*Heudelot* 303. *T. Vogel* 34; 41; 99. *Oldfield. Barter* 886. *Mann* 188; 713; 2236. *Johnston* 83. *Sc. Elliot* 4090; 4789. *Millen* 49. *Whyte. Farmar* 294; 306. *Talb.* 3127; 3706. *Kersting* 39. *Preuss* 1148. (See Appendix).

14. DREPANOCARPUS G. F. Meyer—F.T.A. 2 : 237.

Branchlets armed with pairs of recurved stipular spines; leaves compound, 5–7-foliolate; leaflets oblong-elliptic, rounded at each end, up to 4·5 cm. long and 2 cm. broad, minutely pubescent below, pitted above, with numerous lateral nerves and a thick margin; flowers in small axillary and terminal panicles; calyx glabrous; fruits broadly sickle-shaped, about 3 cm. in diam., flattened, laxly nervose, glabrous *lunatus*

D. lunatus *G. F. Meyer*—F.T.A. 2 : 237; Stapf 597; Chev. Bot. 211. *D. africanus* G. Don. A glabrous shrub, erect or sometimes straggling, thorny and with purple flowers.
In salt marshes and tidal portions of the rivers from Senegal to Angola; also in tropical America. Exsicc.—*Afzelius. Don. Heudelot. T. Vogel* 49; 77. *Barter* 20147. *Mann* 466. *Sc. Elliot* 4335. *Whyte.*

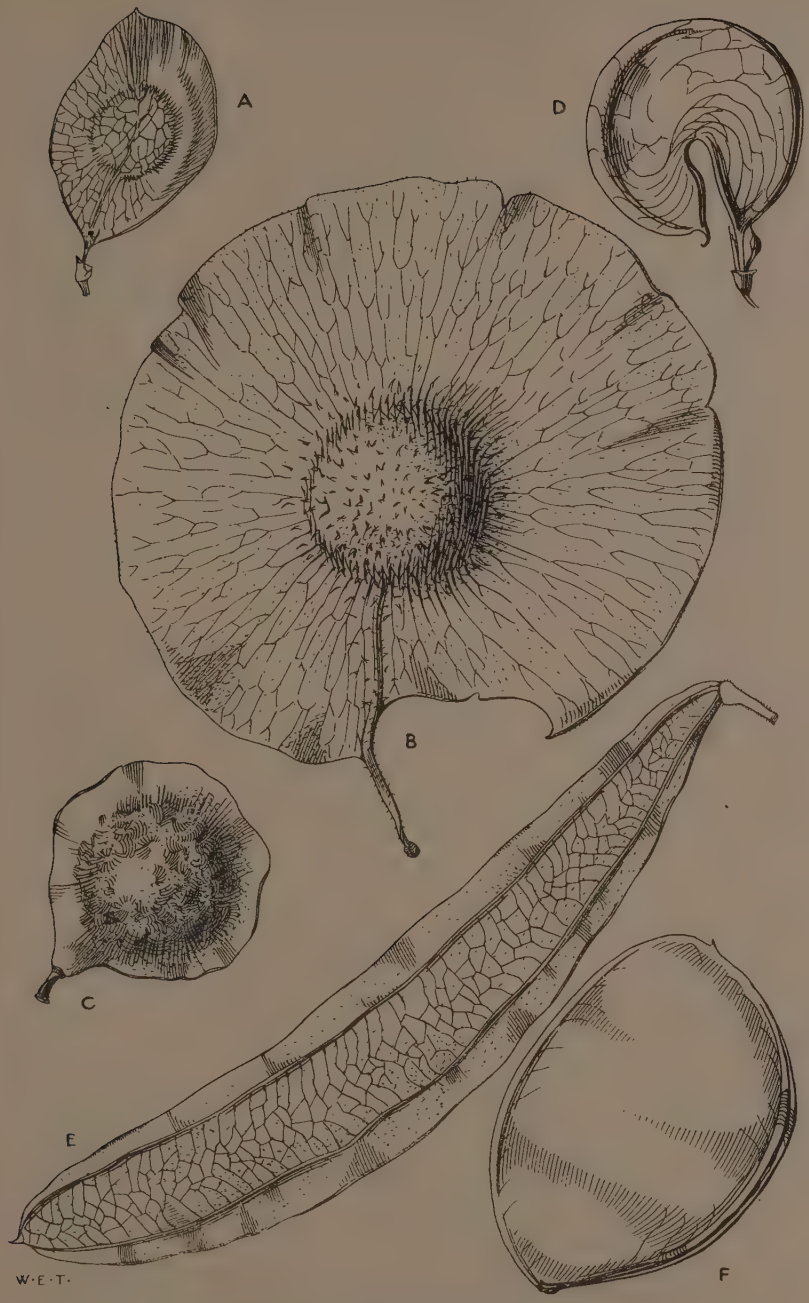

FIG. 144.—FRUITS OF PAPILIONACEAE.

A, PTEROCARPUS LUCENS *Guill. & Perr.* B, P. OSUN *Craib.* C, P. SANTALINOIDES *L'Hér.* D, DREPANOCARPUS LUNATUS *G. F. Meyer.* E, OSTRYODERRIS CHEVALIERI *Dunn.* F, OSTRYOCARPUS RIPARIUS *Hook. f.*

15. **ANDIRA** Lam.—F.T.A. 2 : 246.

A tree ; branchlets shortly tomentellous ; leaves imparipinnate, alternate ; leaflets 5–6 pairs, stipellate, narrowly oblong, slightly acuminate and emarginate, up to 8 cm. long and 4 cm. broad, at first pubescent below, soon glabrous, the terminal leaflet rather long-stalked and more obovate ; stipellae rigidly subulate ; flowers in large spreading panicles ; pedicels very short ; calyx cupular, 4 mm. long, with very short teeth, pubescent ; corolla about 1·3 cm. long ; stamens diadelphous ; fruit ovoid, shortly pointed, about 4 cm. long and 2·5 cm. thick, glabrous, 1-seeded *inermis*.

A. inermis *H. B. & K.*—F.T.A. 2 : 246 ; Chev. Bot. 216. *A. jamaicensis* Urb. *Lonchocarpus Staudtii* Harms. A tree 20–30 ft. high, with handsome pink flowers and fruits pendulous, resembling a small mango.
French Sudan : Macina (Sept.) ! Gourma. Senegal ! Togo : Tamberma ! N. Nigeria : Yola Prov. (fr. May) ! Sokoto Prov. (south, May) ! S. Nigeria : Johann-Albrechtshöhe (Mar.) ! Extends to Cameroons and E. Sudan ; also in tropical America. Exsicc.—*Heudelot* 54 ; 380. *Dalz.* 168. *Lely* 832. *Chev.* 24917. *Kersting* A. 554. *Staudt* 912. (See Appendix).

16. **OSTRYOCARPUS** Hook. f.—F.T.A. 2 : 240 ; Dunn in Kew Bull. 1911 : 362.

Inflorescence with numerous lateral branches ; calyx only slightly lobed :
Leaflets 5, elliptic to obovate, rounded at each end, with a twisted apex, 8–20 cm. long, 4–10 cm. broad, glabrous and reticulate on both surfaces ; panicles elongated, many-flowered, up to 30 cm. long, the lateral branches rather short, up to 4 cm. ; fruit broadly elliptic, flat, about 7 cm. long and 5 cm. broad, glabrous 1. *riparius*
Leaflets 7, scarcely reticulate ; lateral branches of inflorescence 5-6 cm. long, the flower-buds rather larger than in preceding, otherwise as in that species 2. *major*
Inflorescence not branched, up to 15 cm. long ; flowers fasciculate on the raceme ; calyx deeply lobed, lobes very acute ; leaflets 8–11 pairs, oblong, rounded and slightly unequal-sided at the base, 3–7 cm. long, 1·5–3 cm. broad, thinly pubescent below ; young shoots and pedicels tomentellous, the latter nearly 1 cm. long, articulating at the top ; fruits oblong-lanceolate, 8–11 cm. long, 1-seeded, slightly pubescent, laxly reticulate 3. *Welwitschii*

1. **Ostryocarpus riparius** *Hook. f.*—F.T.A. 2 : 240 ; Stapf 597 ; Chev. Bot. 213. *Millettia micrantha* Harms. A glabrous climbing or straggling shrub, with yellowish-white flowers ; habitat semi-aquatic.
French Guinea : Rio Nunez ! Sierra Leone : Bagroo R. (Apr.) ! Pujehun (Mar.) ! Campbell Town (July) ! Liberia : Sino Basin ! Grand Bassa (Aug.) ! Ivory Coast : Assinie ; Cavally Basin, near the sea between Tabou and Beriby. S. Nigeria : Niger River, ? locality ! Fernando Po (Nov.) ! Extends to Gabon. Exsicc.—*Heudelot* 817. *T. Vogel* 59 ; 107 ; 146. *Mann* 832. *Whyte. Dinklage* 1725 ; 1906. *Chevalier* (l.c.) also records this species from the Delaba Plateau, French Guinea.
2. **O. major** *Stapf* in Journ. Linn. Soc. Bot. 37 : 90 ; Stapf 597. Like the last.
Liberia : Monrovia ! Exsicc.—*Whyte*.
3. **O. Welwitschii** *Baker.*—F.T.A. 2 : 240 ; Chev. Bot. 213. *O. racemosus* A. Chev. A wide-climbing shrub ; flowers pinkish-white or yellow with red spots.
French Guinea : Mamou (Jan.) ! Kouroussa (Nov.) ! Dalaba Plateaux. Fello. Sierra Leone : Falaba (fr. Apr.) ! Togo ; Misahöhe (Nov.) ! Dahomey : Savalou. S. Nigeria : Lagos Colony ! Abeokuta (fr. Jan.) ! Olokemeji (fr. Jan.) ! Extends to Angola. Exsicc.—*Sc. Elliot* 5443. *Rowland. Millen* 48. *Dodd* 377. *Chev.* 20368. *Pobéguin* 593. *Mildbraed* 7388. (See Appendix).

17. **LEPTODERRIS** Dunn in Kew Bull. 1910 : 386.

Leaves more or less strongly reticulate and softly tomentellous below ; stipels very short :
Leaflets undulate in the upper half, widely notched at the apex and sometimes acuminate, obovate, up to 15 cm. long and 10 cm. broad, becoming glabrous above, grey-tomentellous below and closely reticulate ; branchlets and leaf-rhachis softly tomentellous ; racemes of fascicles elongated and slender ; flowers nearly 1·5 cm. long 1. *brachyptera*
Leaflets entire, not notched, broadly obovate-elliptic, mucronate, 5–8 cm. long, 3–6 cm. broad, rather densely pubescent below but not grey ; inflorescence a laxly branched panicle, fulvous-pubescent ; flowers 6–7 mm. long 2. *micrantha*
Leaves glabrous or nearly so below, not or only slightly reticulate ; stipels subulate and conspicuous :
Leaflets shortly cuneate at the base, rounded to a mucronate tip, broadly obovate, 9–12 cm. long, 4·5–6 cm. broad, very minutely pubescent below ; panicles axillary, up to 12 cm. long ; flowers 1·4–1·5 cm. long ; fruits broadly elliptic, 4 cm. long, 3 cm. broad, glabrous, narrowly winged on one side 3. *cyclocarpa*
Leaflets rounded at the base, elliptic, very shortly acuminate, 7–15 cm. long, 5–8 cm. broad, minutely pubescent below ; panicles large, with long slender branches ; flowers crowded and subfasciculate, about 1 cm. long 4. *fasciculata*

1. **Leptoderris brachyptera** *Dunn* in Kew Bull. 1910 : 388 ; Chev. Bot. 216. *Derris brachyptera* Baker F.T.A. 2 : 246. *Spatholobus ? africanus* Baker—F.T.A. 2 : 188. *Lonchocarpus brachypterus* Benth. *Leptoderris reticulata* Dunn. A widely climbing shrub, sometimes erect, with abundant inflorescence of pink or whitish flowers.
French Guinea : Futa Jallon, by watercourses ! Kindia (Mar.). Kissidougou (Feb.). Dahomey : Zagnanado (Feb.) ! S. Nigeria : Lagos Colony (Aug.) ! Oban ! Fernando Po ! Exsicc.—*Heudelot* 828. *Mann* 157. *Rowland. Talb.* 1511.
2. **L. micrantha** *Dunn* l.c. 389. A climbing shrub with purple flowers.
S. Nigeria : Ijero (Nov.) ! Exsicc.—*Millen* 43.

3. **L. cyclocarpa** *Dunn* in Kew Bull. 1914 : 245 ; Chev. Bot. 216. A climbing shrub, glabrous except the inflorescence ; flowers yellow.
French Guinea : Ditinn (Apr.) ! Exsicc.—*Chev.* 13578.
4. **L. fasciculata** *Dunn* in Kew Bull. 1910 : 390 ; Chev. Bot. 216. *Lonchocarpus ? fasciculatus* Benth.—F.T.A. 243 ; Chev. Bot. 214. *Leptoderris Dinklagei* Harms. A lofty woody climber, with stem sometimes 1 ft. in diameter, and rusty velvety branchlets ; flowers rather small, fragrant, white, in panicles up to 18 in. long.
Senegal : Casamance, etc. ! French Guinea : Futa Jallon ! Kindia (Mar.). Farana, between Balle and Sulimania (Jan.) ! Between the Konkouré and Timbo (Mar.). Sierra Leone : Freetown and environs ! Regent (Jan.) ! Liberia : Peahtah (Oct.) ! Monrovia (Oct.) ! S. Nigeria : Eket ! Also in Cameroons and Spanish Guinea. Exsicc.—*Heudelot* 693. *Morson. Sc. Elliot* 5934. *Talb.* 3342. *Dalz.* 8118. *Chev.* 3424 ; 20439. *Linder* 922. *Dinklage* 2740.

18. OSTRYODERRIS Dunn in Kew Bull. 1911 : 363.

Flowers precocious ; branchlets very thick, marked by the large scars of the fallen leaves ; panicles softly tomentose ; calyx about 5 mm. long, tomentose ; leaflets glaucous-grey, about 6 pairs, ovate-elliptic, rounded and emarginate at the apex, 8–11 cm. long, 3–5·5 cm. broad, with about 5–7 pairs of lateral nerves ; stipels inconspicuous ; fruits flat and thin, with a parallel line within each margin, broadly oblong-linear, up to 15 cm. long and 3 cm. broad, reticulate within the parallel lines, slightly pubescent .. .. 1. *Chevalieri*

Flowers not precocious ; leaflets acuminate :

Bracts large, ovate, covering the buds and semi-persistent :

Leaf-rhachis glabrous ; leaflets about 5 pairs, oblong-elliptic or oblong-lanceolate, obliquely abruptly acuminate, 6–10 cm. long, 2–4 cm. broad, glabrous ; stipels subulate, persistent ; panicles elongate, terminal ; bracts subacute ; fruit flat, oblong-elliptic, 7–12 cm. long, 3–4 cm. broad .. .. 2. *leucobotrya*

Leaf-rhachis softly pubescent ; leaflets 4–5 pairs, oblong-elliptic, abruptly acuminate, subcordate at the base, 6–10 cm. long, 2·5–4·5 cm. broad, pubescent on the nerves below ; stipels subulate, persistent ; panicles elongated ; bracts ovate, acuminate 3. *impressa*

Bracts small and narrow, not covering the buds, early deciduous ; leaflets about 4 pairs, ovate-elliptic, obtusely acuminate, rounded or subcordate at the base, 9–15 cm. long, 4–8 cm. broad, glabrous ; stipels subulate, persistent ; panicles terminal, elongated ; fruits similar to *O. Chevalieri* but a little broader 4. *gabonica*

1. **Ostryoderris Chevalieri** *Dunn* in Kew Bull. 1914 : 335. *Lonchocarpus argentea* A. Chev. A deciduous tree up to 40 or 50 ft. high, with bark separating in thick scales ; flowers white in crowded narrow grey- or rusty-tomentose panicles ; pods 1- or 2-seeded.
French Sudan : Siguiri (Feb.) ! Senegal ! Bakel, etc. (June) ! Sierra Leone : Falaba (Mar.) ! Berria ! N. Nigeria : Sokoto Prov., Damri, Anka, etc. (fl. Feb., fr. May, June, Dec.) ! Exsicc.—*Heudelot* 347. *Sc. Elliot* 5225. *Dalz.* 309. *Lely* 835. *Chev.* 298 ; 26047. (See Appendix).
2. **O. leucobotrya** *Dunn* in Kew Bull. 1911 : 364 ; Chev. Bot. 216. A forest tree or shrub, sometimes climbing ; flowers white in red-brown tomentellous panicles.
Sierra Leone : near Leicester Peak (Dec.) ! Regent (Jan.) ! Pangumu ! Bandajuma ! Mano Salija (Nov.) ! Bawama (Jan.) ! Liberia : Monrovia (Nov.) ! Ivory Coast : Bingerville (Dec.) ! Exsicc.—*Sc. Elliot* 3842. *Smythe* 62. *Lane-Poole* 35. *Burbridge* 476. *King-Church* 5. *Linder* 1542. *Deighton* 290. *Dalz.* 8116.
3. **O. impressa** *Dunn* l.c. 363. A climbing shrub with rusty-pubescent striate branchlets ; flowers white in rusty narrow panicles.
S. Nigeria : Benin, Ugbojiobo (May) ! Calabar ! Also in French Cameroons. Exsicc.—*Williams* 4. *Farquhar* 5. (See Appendix).
4. **O. gabonica** *Dunn* in Kew Bull. 1911 : 364. *Andira gabonica* Baill. *Lonchocarpus macrostachyus* Bak. F.T.A. 2 : 243, partly, not of Hk. f. A straggling or climbing shrub ; flowers white or pinkish in narrow red-brown panicles.
S. Nigeria : Calabar (Feb.) ! Eket ! Ila (Oct.) ! Cameroons River (Jan.) ! Also in Gabon. Exsicc.—*Mann* 2192 ; 2244. *Talb.* 3070. *Thomas* 1919.

19. LONCHOCARPUS H. B. & K.—F.T.A. 2 : 241.

Standard petal densely silky on the outside ; branchlets flexuose ; leaflets 7–11, ovate or elliptic, obtusely acuminate, rounded or subcordate at the base, up to 14 cm. long and 9 cm. broad, shortly pubescent below, with prominent lateral nerves ; flowers dense in pendulous axillary racemes ; pedicels usually paired ; calyx truncate, cupular, 5 mm. long, tomentose ; fruits 1–several-seeded, up to 12 cm. long, tomentellous .. .. 1. *sericeus*

Standard petal glabrous on the outside :

Inflorescence a simple slender axillary raceme, racemes either solitary or fasciculate ; leaflets about 4 pairs, markedly acuminate, more or less elliptic, up to 10 cm. long and 5 cm. broad, glabrous ; stipels subulate, persistent ; calyx shallowly lobed, shortly pubescent ; fruits flat, linear-lanceolate, 6–9 cm. long, glabrous 2. *Griffonianus*

Inflorescence a much-branched panicle ; leaflets at most very slightly acuminate ; stipels inconspicuous :

Trees or erect shrubs ; flowers in panicles on the older wood :

Leaflets elliptic, rounded at each end, 3–5·5 cm. long, 1·5–3 cm. broad, shortly pubescent on both surfaces ; panicles lax ; pedicels very short ; calyx toothed, ciliate and shortly pubescent outside ; fruits flat and thin, about 9 cm. long, rounded at the apex .. .. 3. *laxiflorus*

Leaflets mostly obovate-elliptic, shortly cuneate at the base, 7–16 cm. long, 3–7 cm. broad, glaucous, minutely pubescent on both surfaces; flowers as *L. laxiflorus*; fruits up to 12 cm. long, acute, 1–4-seeded .. .. .. 4. *Philenoptera*

Climber; flowers in panicles accompanying the leaves; lateral branchlets of panicles very short; leaflets 4–5 pairs, ovate or elliptic, shortly acuminate, up to 16 cm. long and 8 cm. broad, glabrous, with about 5 pairs of lateral nerves; calyx shortly lobed, pubescent outside; fruits 1–5-seeded, flat, glabrous, reticulate, the seeds very prominent .. .. 5. *cyanescens*

1. **Lonchocarpus sericeus** *H. B. & K.*—F.T.A. 2 : 241; Holl. 246; Stapf 597; Chev. Bot. 215. A tree up to 40 ft. or more high, with brownish downy branchlets and pale red-purple or lilac fragrant flowers, commonly flowering in the deciduous state.

Common in fringing and semi-deciduous forests throughout the area; extends south to Angola and Princes Island; also in tropical America. Exsicc.—*Heudelot* 623. *Skues. T. Vogel* 21; 35; 60; 61; 67; 169; 186; 201. *Barter* 1598; 1608; 1611; 1614. *Irving. Sc. Elliot* 4092. *Johnson* 120; 686; 734. *Elliott* 3; 69. *Punch* 116. *Talb.* 3325. (See Appendix).

2. **L. Griffonianus** *Dunn* in Hook. Ic. Pl. t. 3040; Chev. Bot. 214. *Millettia Thonningii* Baker in F.T.A. 2 : 128, partly. *Derris leptorhachis* Harms. A tree up to 30–40 or more ft. high, with glabrous branchlets and Wistaria-like flower racemes, not pendulous.

Ivory Coast: Lower Cavally, between Prolo and Bliéron. Guinea Coast: ? locality! N. Nigeria: Lokoja (Mar.)! S. Nigeria: Lagos, Ikoyi (Jan.)! Lagos Colony! Igbessa (Jan.)! Epe! Onitsha! Calabar (Feb.)! Oban! Eket! Degema! Fernando Po! Extends south to Lower Congo and Angola. Exsicc.—*Barter* 1623; 3265. *Mann* 1436; 2282. *Moloney*. *Millen* 129. *Talb.* 1309; 3040; 3099; 3669. (See Appendix).

FIG. 145.—LONCHOCARPUS CYANESCENS *Benth.* (PAPILIONACEAE).

A, standard petal. B, wing petal. C, keel petal. D, calyx and stamens. E, pistil in longitudinal section. F, fruit. G, seed.

3. **L. laxiflorus** *Guill. & Perr.*—F.T.A. 2 : 242, partly; Chev. Bot. 214. A tree 15–20 ft. high, with lilac or purplish flowers in copious lax panicles.

French Sudan: Macina! Senegal: Bondou, etc.! Gambia! Exsicc.—*Heudelot* 152. *Dawe* 63. *Brooks* 6. *Pirie* 40.

4. **L. Philenoptera** *Benth.* in Journ. Linn. Soc. 4 : Suppl. 97. *L. laxiflorus* Baker in F.T.A. 2 : 242, partly, not of Guill. & Perr. A tree like the last.

N. Nigeria: Kontagora (Jan., fr. Feb.)! Sokoto (Mar.)! Yola! Katagum! Lake Chad! Extends to Abyssinia and E. Sudan. Exsicc.—*Dalz.* 13. *Moiser. Talb.* 1237. (See Appendix).

5. **L. cyanescens** *Benth.*—F.T.A. 2 : 243; Holl. 244; Chev. Bot. 214; Engl. Pflanzenw. Afr. 640, fig. 307. A woody climbing or straggling shrub, in cultivation forming a shrub 7–8 ft. high; branchlets silky when young, the young leaves turning bluish-black in drying; flowers reddish turning blue in panicles up to a foot long.

Common in the coastal districts and in forests; in Nigeria north to Nupe! Fernando Po (July)! Also in N.W. Cameroons. Exsicc.—*Smeathmann. Turner. Morson. Barter* 1593; 3360; 3443. *Mann* 401; 2280. *Moloney. Sc. Elliot* 4786; 5284; 5722; 5739. *Talb.* 3162; 3339. *Warnecke* 195. (See Appendix).

20. MILLETTIA Wight & Arn.—F.T.A. 2 : 126; Dunn in Journ. Linn. Soc. Bot. 41 : 123.

Lower leaf-surface completely covered or nearly so by a close felt of adpressed silky hairs:

Calyx lobed nearly to the middle:

Flowers sessile or subsessile (pedicel up to 1 mm. long):

Lateral nerves 7–9 pairs; calyx-lobes not keeled; leaflets about 5 pairs, oblong, obtusely acuminate, 5–8 cm. long, 1·5–2·5 cm. broad; panicles longer than the leaves, narrow, the lateral branches short, tomentellous .. .. 1. *lucens*

Lateral nerves 13–15 pairs ; calyx-lobes markedly keeled, especially in bud ; leaflets about 6 pairs, oblong-lanceolate, shortly acutely acuminate, 4–8 cm. long, 1·5–3 cm. broad ; panicles terminal, broad, branches tomentellous ; young fruits oblanceolate, about 8–9 cm. long, densely tomentose .. .. 2. *Dinklagei*

Flowers on pedicels about 3 mm. long ; calyx-lobes keeled in bud ; leaflets 3–4 pairs, oblong-oblanceolate, long-acuminate, 9–15 cm. long, 3–6 cm. broad ; panicles terminal, with tomentose branches .. .. 3. *hypolampra*

Calyx very shortly toothed ; lateral nerves 10–15 pairs ; flowers shortly pedicellate, numerous and crowded ; leaflets 3 pairs, oblong to oblong-obovate, shortly acuminate, broadly narrowed to the base, up to 15 cm. long and 6 cm. broad ; corolla 1·4 cm. long :

Leaflets very closely appressed-silky below .. .. .. 4. *chrysophylla*

Leaflets loosely velvety-tomentose below ; fruits narrowly oblong, densely tomentose, 11–12 cm. long .. .. 5. *hirsuta*

Lower leaf-surface visible between the hairs or glabrous :

Inflorescence a simple raceme, unbranched [1] or with very short lateral branchlets, the flowers appearing subfasciculate :

Calyx-tube glabrous outside ; leaflets oblong-oblanceolate, long- and more or less triangular-acuminate, 4–5 cm. long ; stipels very prominent, linear-subulate ; inflorescences ⅓–½ as long as the leaves .. .. 6. *Lane-Poolei*

Calyx-tube shortly pubescent outside :

Leaflets averaging about 5 cm. long and 1–2 cm. broad, more or less oblong-oblanceolate, cuneate at the base, abruptly and obtusely acuminate, pubescent below, especially on the midrib ; stipels subulate, persistent ; inflorescence longer than the leaves .. .. 7. *rhodantha*

Leaflets averaging much larger than above :

Leaflets more or less ovate or ovate-elliptic, or if obovate-oblanceolate and rather narrow then stipels caducous, very shortly and obtusely pointed ; midrib villous at the base below ; racemes short ; pedicels with a pair of small bracteoles near the middle ; standard shortly pubescent outside ; fruits oblanceolate, beaked, up to 15 cm. long, flat, glabrous .. .. 8. *Thonningii*

Leaflets more or less caudate-acuminate, broadly elliptic to obovate ; pedicels with the bracteoles near the top or not evident :

Stipels subulate, short, persistent ; inflorescence comparatively short (about 10–15 cm. long), the axis glabrous or nearly so ; leaflets about 6 pairs, elliptic-obovate, 6–10 cm. long, up to 5 cm. broad, glabrous ; fruits nearly glabrous 9. *pallens*

Stipels absent or early caducous ; inflorescence usually elongated (25 cm. long or more), the axis puberulous or shortly pubescent :

Standard silky outside :

Leaflets glabrous below, oblong-elliptic, abruptly acuminate, rounded at the base, 10–20 cm. long, 5–8 cm. broad, thin ; fruits linear, 13 cm. long, 3 cm. broad, glabrous .. .. 10. *sanagana*

Leaflets shortly pubescent below :

Leaf-rhachis and nerves below glabrous or nearly so ; leaflets elliptic-obovate, abruptly acutely acuminate, 6–12 cm. long, 3–6 cm. broad ; standard 2·5 cm. long .. .. 11. *Stapfiana*

Leaf-rhachis and nerves below pilose with spreading hairs ; leaflets obovate-elliptic, very abruptly caudate-acuminate, 8–11 cm. long, 3·5–5 cm. broad ; standard 1·5 cm. long .. .. 12. *pilosa*

Standard glabrous outside :

Pedicels slender, about 8 mm. long ; leaflets 5–6 pairs, broadly elliptic, shortly acuminate, rounded at the base, up to 17 cm. long and 10 cm. broad, minutely puberulous below ; standard 2·5 cm. long ; fruits oblanceolate, 15 cm. long, thinly tomentellous .. .. 13. *macrophylla*

Pedicels stout, 3–4 mm. long ; leaflets about 7–8 pairs, narrowly oblong-elliptic, shortly acuminate, 8–15 cm. long, 3–4·5 cm. broad, rusty-pubescent below ; standard 2·5 cm. long ; fruits linear-oblanceolate, beaked, about 15 cm. long, densely rusty-tomentose .. .. 14. *aboensis*

Inflorescence much-branched, the lower branches spreading and fairly long :

Standard hairy outside :

Flowers 3–3·5 cm. long ; pedicels 6–7 mm. long ; leaflets 7–8 pairs, oblong, caudate-acuminate, 5–8 cm. long, 1·5–2·5 cm. broad, with about 6 pairs of lateral nerves, minutely pubescent below ; fruits oblanceolate, 10 cm. long, glabrous 15. *Zechiana*

Flowers up to 1·5 cm. long ; pedicels very short ; leaflets 3–4 pairs, elliptic or obovate-elliptic, abruptly and obtusely acuminate, 9–15 cm. long, 4–8 cm. broad, glabrous or nearly so below especially on the midrib ; inflorescences very slender and

[1] Sometimes through the fall of the leaves the flowering shoots resemble a branched inflorescence.

elongated; fruits (young) oblong-oblanceolate, curved tomentose, about 7 cm. long, 2 cm. broad .. .. 16. *Barteri*

Standard glabrous outside:

Bracts persistent, ovate-lanceolate, pubescent; leaflets about 5 pairs, oblong or oblong-oblanceolate, shortly acuminate, 4–6 cm. long, 1·5–2·5 cm. broad, silky-pubescent below; calyx 5 mm. long; fruits curved, linear, 10–12 cm. long, densely velvety-tomentose .. .. 17. *Irvinei*

Bracts deciduous:

Leaflets at most 3 cm. broad, more or less narrowly oblong; inflorescence more or less pyramidal; stipels present:

Indumentum of calyx brown; leaflets oblong-oblanceolate, acuminate and mucronate, 4–6 cm. long, about 2 cm. broad; stipels very small and subulate; fruits 9 cm. long, slightly pubescent .. .. 18. *Warneckei*

Indumentum of calyx black-purple; other characters more or less as in preceding but stipels longer and conspicuous .. .. .. 19. *porphyrocalyx*

Leaflets 5 cm. or more broad, broadly elliptic; stipels absent; panicles much longer than the leaves, with numerous blackish-tomentellous branchlets; flowers subsessile; standard 1·5 cm. long .. .. 20. *melanocalyx*

1. **Millettia lucens** *Dunn* in Journ. Bot. 49 : 220; Journ. Linn. Soc. Bot. 41 : 193. *Lonchocarpus lucens* Scott Elliot. A shrub with apparently purplish flowers.
Sierra Leone: Samu country, in thickets (Dec.)! Liberia: Peahtah (Oct.)!—Exsicc.—*Sc. Elliot* 4241. *Linder* 904; 1064.
2. **M. Dinklagei** *Harms* in Engl. Bot. Jahrb. 26 : 287; Stapf 593; Dunn in Journ. Linn. Soc. Bot. 41 : 195. A shrub or small tree 15 ft. high, with white flowers in ample panicles.
Liberia: Grand Bassa, in the littoral bush (Aug.-Oct.)! Exsicc.—1672; 1964.
3. **M. hypolampra** *Harms* in Engl. Bot. Jahrb. 33 : 168; Dunn in Journ. Linn. Soc. Bot. 41 : 194. A shrub or tree, with leaflets pale satiny below.
S. Nigeria: Oban! Also in French Cameroons. Exsicc.—*Talb.* 578; 1709.
4. **M. chrysophylla** *Dunn* in Journ. Bot. 49 : 220; Journ. Linn. Soc. Bot. 41 : 199; Chev. Bot. 182. A tree 40–50 ft. high, with white flowers.
French Guinea: Kouria, on banks of Konkouré R. (Oct.)! Ivory Coast: Lower Cavally, between Prolo and Bliéron (Aug.)! Exsicc.—*Caille* in *Herb. Chev.* 15002.
5. **M. hirsuta** *Dunn* in Journ. Linn. Soc. Bot. 41 : 208; Chev. Bot. 183. A small tree with leaves and fruits densely golden-brown-tomentose.
Ivory Coast: Agbo Bridge (Dec., Jan.)! Indénié, near Mbasso (Dec.). Exsicc.—*Chev.* 16829; 22640; 22644.
6. **M. Lane-Poolei** *Dunn* in Kew Bull. 1914 : 79. A small glabrous tree 15 ft. high, with pale lilac or purplish flowers; common in Sierra Leone.
Sierra Leone: Kennema (Mar.)! Falaba (Apr.)! Exsicc.—*Lane-Poole* 140; 202; 203. *Aylmer* 40; 41; 42; 43. *King-Church* 13. *Thomas* 41. (See Appendix).
7. **M. rhodantha** *Baill.*—F.T.A. 2 : 131, partly; Dunn in Journ. Linn. Soc. 41 : 198; Chev. Bot. 183. *Lonchocarpus multifolia* Dunn. A tree 30–40 ft. high, with bright bluish-pink flowers.
French Guinea: Rio Nunez! Sierra Leone: in forests (Apr.)! Moyamba (Mar.)! Pujehun (Feb.)! Ivory Coast: Soubré, on banks of Sassandra R. (June)! Gold Coast: Dunkwa (May)! Exsicc.—*Heudelot* 815. *Morson.* *Vigne* 880. (See Appendix).
8. **M. Thonningii** *Baker*—F.T.A. 2 : 128, partly; Dunn in Journ. Linn. Soc. Bot. 41 : 215; Stapf 593; Chev. Bot. 183. *Robinia Thonningii* Sch. & Thonn. *M. Atile* Harms. A tree 30–40 ft. high, with Wistaria-like mauve flowers appearing before the leaves, Aug. to Mar., fruiting in Dec.; often planted.
Liberia: Grand Bassa! Common from Gold Coast to S. Nigeria; also in St. Thomas Island and Angola (probably cultivated). Exsicc.—*Barter* 481; 1618; 1624. *Irving.* *Rowland.* *Johnson* 456; 911. *MacGregor* 216. *Elliott* 36; 37. *Warnecke* 66. (See Appendix).
9. **M. pallens** *Stapf* in Johnston, Liberia 2 : 593; Dunn in Journ. Linn. Soc. Bot. 41 : 218; Chev. Bot. 183. A glabrous shrub or medium-sized tree with pale or reddish-purple flowers about ¾ in. long, flowering Jan. to Mar.
Common from French Guinea to Liberia! Exsicc.—*Heudelot* 793. *Sc. Elliot* 4609; 5771; 5839. *Johnston* 68. *Whyte.* *Farmar* 259. (See Appendix).
10. **M. sanagana** *Harms* in Engl. Bot. Jahrb. 26 : 288; Dunn in Journ. Linn. Soc. 41 : 216; Chev. Bot. 183. A shrub or small tree with large leaflets, and reddish-purple flowers more or less fasciculate on the rhachis.
French Guinea: Konakry (Jan., Feb.)! La Santa Valley (Mar.). Sierra Leone: Kambia (Dec.)! Koflu (fr. Jan.)! Yelisanda! Fernando Po (June)! Also in French Cameroons. Exsicc.—*Barter* 1597. *Sc. Elliot* 4225b; 4598. *Smythe* 66. *Dalz.* 8066.
11. **M. Stapfiana** *Dunn* in Journ. Linn. Soc. Bot. 41 : 217. *M. Zechiana* Dunn l.c. 217, partly; Chev. Bot. 184, not of Harms. *M. ivorensis* A. Chev. Bot. 183. A shrub or small tree up to 20–30 ft. high, with comparatively large rosy flowers.
Ivory Coast: several localities! Gold Coast: Aburi Hills (Oct.)! Obuasi (Jan.)! Togo. S. Nigeria: Oban! Old Calabar! Cameroons River (Jan.)! Exsicc.—*Mann* 2216. *Johnson* 464. *Talb.* (no number). *Chev.* 15310; 17969; 19142; 19556; 19740 bis; 22473. *Vigne* 236.
12. **M. pilosa** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined.
S. Nigeria: Oban! Exsicc.—*Talb.* 583; 1308.
13. **M. macrophylla** *Hook. f.*—F.T.A. 2 : 127; Dunn in Journ. Linn. Soc. Bot. 41 : 212. *M. Hookeriana* Taub. A small tree up to 15 or more ft. high, more or less glabrous, with rather large leaflets and pink or purple flowers fasciculate on erect racemes 1–2 ft. long.
S. Nigeria: Degema! Fernando Po (Nov.)! Also in French Cameroons and French Congo. Exsicc.—*T. Vogel* 117. *Talb.* (no number).
14. **M. aboensis** *Hook. f.*—F.T.A. 2 : 130; Dunn in Journ. Linn. Soc. Bot. 41 : 214. A tree 30–40 ft. high, dark-brown pubescent on the petioles, branchlets and inflorescence; flowers purple in erect woody racemes up to 18 in. long.
S. Nigeria: Abo! Onitsha! Angiama! Benin! Bonny (Oct.)!. Calabar! Cross R.! Also in Cameroons and Spanish Guinea. Exsicc.—*Ansell.* *T. Vogel.* *Barter* 148; 1806. *Mann* 512. *Johnston.* *Dennett* 15.
15. **M. Zechiana** *Harms* in Engl. Bot. Jahrb. 40 : 36; Dunn in Journ. Linn. Soc. Bot. 41 : 217, partly. A tree 15–30 ft. high, with more or less glabrous branchlets; flowers reddish-purple, golden-silky outside.
Sierra Leone: Panguma! Liberia: Bakratown (Oct.)! Togo: Vedeme (Dec.). Ketschentzi (Nov.). Exsicc.—*Smythe* 127. *Linder* 856.
16. **M. Barteri** *Dunn* in Journ. Bot. 49 : 221; Journ. Linn. Soc. Bot. 41 : 210, partly; Chev. Bot. 182. *Lonchocarpus Barteri* Benth.—F.T.A. 2 : 243. *L. Heudelotianus* Baill. *M. calabarica* Dunn. A lofty woody climber, with pith in the stems, perhaps sometimes erect; flowers pink or red turning purple.

French Guinea : Rio Nunez, in inundated places ! Farana (May) ! Kaba Valley : Futa Jallon, Kouria. Sierra Leone : Samu country (Dec.) ! Bagroo R. (Apr.) ! Taiya R. ! Liberia : Kakatown ! Ivory Coast : Bouroukrou. N. Nigeria : Nupe ! Lokoja (Mar.) ! S. Nigeria : Epe ! Ikirun ! Lagos Colony ! Oba R. ! Brass ! Oban ! Calabar (Feb.) ! Also in French Cameroons and E. Sudan. Exsicc.—*Guillemin* 803. *Barter* 67 ; 1609 ; 3253 ; 3401. *Mann* 822 ; 2259. *Sc. Elliot* 4202. *Millson. Rowland. Whyte. Talb.* 1721. *Chev.* 13174.

17. **M. Irvinei** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Robinia multiflora* Schumach. (not *Millettia multiflora* Coll. & Hemsl.). A shrub or small tree with branchlets, etc., brown-pubescent, and white flowers.

Gold Coast : Accra Plains (Apr., fr. June) ! Exsicc.—*Thonning. Irvine* 47 ; 99 ; 211. (See Appendix).

18. **M. Warneckei** *Harms* in Engl. Bot. Jahrb. 30 : 87 ; Dunn in Journ. Linn. Soc. Bot. 41 : 200. *M. aureocalyx* Dunn ; Chev. Bot. 182. A tree about 20 ft. high, or sometimes a climbing shrub, with white or pink flowers and golden or brown-rusty pubescence on the leaflets and inflorescence.

French Guinea : Futa Jallon, Labé (Mar.) ! Between Mamou and Dalaba (May) ! Gold Coast : Accra (Mar.) ! Togo : Bagidar, near Lome, in savannah ! Exsicc.—*Warnecke* 108. *Dalz.* 84. *Chev.* 12399 ; 25823.

19. **M. porphyrocalyx** *Dunn* in Journ. Bot. 49 : 220 ; Chev. Bot. 183. *M. Scott Elliotii* Dunn l.c., and in Journ. Linn. Soc. Bot. 41 : 199. A tree with branchlets and inflorescence clothed with brown-purple hairs.

French Guinea : between the Konkouré and Timbo (Mar.) ! Sierra Leone : Talla Hills, Mussaia (Mar.) ! Exsicc.—*Sc. Elliot* 5126a. *Chev.* 12507.

20. **M. melanocalyx** *Dunn* in Journ. Linn. Soc. Bot. 41 : 197. *Lonchocarpus macrostachyus* Hook. f. *M. macrostachya* Dunn, not of Coll. & Hemsl. A woody climbing shrub, the bark brown, with many lenticels ; flowers greenish-white.

Liberia : Gbanga (Sept.) ! S. Nigeria : on a branch of the Niger near Ibaddi ! Abedemagu (Sept.) ! Barombi ! Exsicc.—*T. Vogel* (no number). *Farquhar* 70. *Preuss* 411. *Linder* 605.

21. CRAIBIA Harms & Dunn in Journ. Bot. 49 : 106 (1911).

Branchlets glabrous ; leaflets 5 and alternate or if 3 then a pair opposite, ovate-elliptic, subcaudate-acuminate, shortly cuneate at the base, 8–10 cm. long, 4–6 cm. broad, glabrous ; racemes terminal, short, brown-tomentose ; pedicels 5 mm. long ; calyx cupular, 3 mm. long, with short triangular teeth ; corolla 1·5 cm. long ; fruits obliquely obovate-oblanceolate, about 5 cm. long, 2·5 cm. broad, 1-seeded, glabrous 1. *atlantica*

Branchlets glabrous ; leaves unifoliolate ; leaflet ovate, sharply acuminate, 6–8 cm. long, 3–5 cm. broad, closely reticulate on both surfaces ; racemes glabrous ; pedicels about 1 cm. long, slender ; calyx 5 mm. long ; corolla 2 cm. long 2. *simplex*

1. **C. atlantica** *Dunn* l.c. 108. A small tree with grey slightly angled branchlets and crowded racemes of white flowers.

N. Nigeria : Lokoja ! S. Nigeria : Lagos ! Olokemeji (Mar., fr. Apr.) ! Aguku ! Also in French Cameroons. Exsicc.—*Barter* 501. *Foster* 19. *Thomas* 958.

2. **C. simplex** *Dunn* l.c. 107. A glabrous shrub or ? small tree, with rather conspicuous flowers in a terminal panicle.

S. Nigeria : Calabar ! Also in Gabon. Exsicc.—*Milne* 1866.

22. MUNDULEA DC.—F.T.A. 2 : 126.

Small shrub with corky bark ; branchlets flexuose, softly tomentellous ; leaflets 6–10 pairs, lanceolate, 2·5–5 cm. long, 1–2 cm. broad, glabrous above, appressed-pubescent below ; flowers in terminal and leaf-opposed racemes up to 15 cm. long ; pedicels 1–1·5 cm. long, pubescent ; calyx toothed, teeth linear, 3 mm. long ; corolla about 2 cm. long ; standard pubescent ; fruit 7–12 cm. long, nearly 1 cm. broad, tomentose, about 6–8-seeded .. .. *suberosa*

M. suberosa *Benth.*—F.T.A. 2 : 126 ; Chev. Bot. 182. A shrub or small bushy tree with lilac or purplish flowers.

All over tropical and parts of South Africa, in the Mascarene Islands and East Indies ; often planted.—Exsicc.—*Irving* 130. *Rowland. Dodd* 425. (See Appendix).

23. TEPHROSIA Pers.—F.T.A. 2 : 104.

Leaves 3–1-foliolate, or occasionally a few 5-foliolate ; leaflets linear-oblanceolate, deeply emarginate or mucronate, up to 7 cm. long, with numerous ascending nerves nearly hidden by the dense silky whitish hairs ; flowers about 1 cm. long ; calyx deeply lobed, densely tomentose ; fruits about 6 cm. long and 8 mm. broad, densely villous .. .. 1. *elegans*

Leaves all pinnately 5- or more-foliolate :

Flowers axillary, solitary or subsolitary :

Fruits narrow, about 12 times as long as broad :

Leaflets obovate or obovate-oblanceolate, more or less emarginate at the apex, 1·5–4 cm. long, thinly villous below ; flowers about 8 mm. long ; calyx-lobes subulate ; fruits about 6 cm. long, densely villous .. .. 2. *uniflora*

Leaflets linear, further characters as in No. 15 .. .. *linearis*

Fruits flat and thin, very shortly and thinly pubescent, about 6 times as long as broad :

Leaflets rounded or acute at the apex (not emarginate), mostly oblanceolate, broader above the middle, 2·5–3·5 cm. long, with about 6 pairs of ascending nerves, thinly appressed-pilose below ; branchlets with spreading weak hairs ; fruits about 2-3 cm. long .. .. 3. *hirsuta*

Leaflets truncate or emarginate at the apex, broadly linear, 3–4 cm. long, thinly appressed-pilose below ; stems pubescent ; habit annual ; flowers about 1 cm. long ; fruits about 3·5–4 cm. long, with thickened margins .. 4. *platycarpa*

Flowers racemose, usually fairly numerous :
Stems procumbent :
Leaves pinnate :
Stipules broadly ovate ; leaflets mostly 3 pairs, obovate-oblanceolate, emarginate and mucronate, about 2 cm. long, appressed-pilose below ; flowers few in short racemes a little longer than the leaves, nearly 1 cm. long ; fruits 2 cm. long, 7–8 mm. broad, 2–3-seeded, very slightly pubescent .. .. 5. *radicans*
Stipules subulate ; leaflets 2 pairs, obovate, emarginate and mucronate, 2–2·5 cm. long, nearly glabrous below ; flowers very few in very short racemes, 0·8 cm. long .. .. 6. *djalonica*
Leaves digitate :
Stems shortly appressed-pubescent, becoming glabrous ; leaves appressed-pilose below ; leaflets linear-lanceolate, acute, 4·5 cm. long, with numerous ascending lateral nerves ; flowers few in lax slender racemes ; fruits 2·5 cm. long, very shortly appressed-pubescent .. .. 7. *digitata*
Stems and leaves covered with with spreading hairs ; leaflets more or less as in preceding but ciliate and broader ; flowers as above ; fruits 3 cm. long, softly pubescent with spreading hairs .. .. 8. *lupinifolia*
Stems more or less erect :
Leaflets 5 or more pairs :
Flowers 2 cm. or more long, densely crowded ; fruits large, 8–12 cm. long, very densely villous or tomentose :
Leaflets oblanceolate, rounded and mucronate at the apex, up to 7 cm. long, with numerous lateral ascending nerves appressed-silky-villous below ; calyx deeply lobed .. .. 9. *Vogelii*
Leaflets oblong-elliptic or oblong-obovate, widely emarginate, 3·5–4·5 cm. long, with numerous ascending lateral nerves, appressed-silky-pubescent below ; calyx very shortly lobed .. .. 10. *densiflora*
Flowers at most about 1 cm. or rarely 1·8 cm. long, usually loosely arranged : fruits smaller, not more than 6 cm. long :
Leaflets 4 cm. or more long or rarely shorter and then linear or almost linear :
Hairs on the stems rather long and spreading ; leaflets oblanceolate to almost linear, mostly emarginate and mucronate, up to 7 cm. long, densely silky below :
Fruits about 4·5 cm. long, nearly 1 cm. broad, thinly pubescent, about 8-seeded .. .. 11. *Ansellii*
Fruits about 5–6 cm. long, 0·5 cm. broad, about 15-seeded .. 12. *barbigera*
Hairs on the stems very short and appressed :
Tall herbs or subshrubs over 40 cm. high :
Pods linear-oblong, 3 cm. long, nearly glabrous, becoming deflexed ; flowers crowded, with numerous persistent bracts ; leaflets deflexed, oblanceolate, widely emarginate, about 6 cm. long, very thinly pubescent .. 13. *deflexa*
Pods narrowly linear, 5–9 cm. long, spreading, pubescent ; flowers rather lax, with fairly broad short bracts ; leaflets linear or linear-oblanceolate, up to 8 cm. long, silky-pubescent below .. .. 14. *bracteolata*
Pods narrowly linear, 4–5 cm. long, spreading, softly pubescent ; flowers very few, with minute bracts ; leaflets linear, densely silky with white hairs below .. .. 15. *linearis*
Small annual up to 15 cm. high, branching from the base .. 4. *platycarpa*
Leaflets up to 2 cm. long, more or less obovate or oblanceolate :
Stems glabrous or very nearly so ; leaflets emarginate, about 1·5 cm. long, softly pubescent below ; flowers few in lax rigid racemes, 6–7 mm. long ; fruits often paired, spreading, linear, 4 cm. long, very thinly pubescent 16. *leptostachya*
Stems softly tomentose or pubescent :
Flowers very few in lax racemes, solitary or paired on the axis ; leaflets narrowly obovate, 2 cm. long, silky-pubescent below ; fruits linear, 5 cm. long, pubescent .. .. 17. *purpurea*
Flowers numerous and rather crowded ; leaflets as above but broader ; fruits 6–7 cm. long, 0·8 cm. broad, grey-pubescent, 4–5-seeded .. 18. *mossiensis*
Leaflets 2–3 pairs :
Inflorescence overtopping the leaves :
Inflorescence dense and fairly stout, several-flowered ; calyx-lobes linear-subulate, nearly 1 cm. long ; leaflets oblanceolate, mucronate, 4–5 cm. long, with about 6–8 pairs of prominent lateral nerves ; fruits crowded, 4 cm. long, very densely villous with blackish hairs .. .. 19. *Preussii*
Inflorescence very slender and capillary, very few-flowered ; leaflets narrowly oblanceolate, 2–2·5 cm. long, thinly pubescent below ; fruits nearly 2 cm. long, slightly pubescent .. .. 20. *gracilipes*
Inflorescence shorter than the leaves ; further characters as in No. 4, *platycarpa*.

1. **Tephrosia elegans** *Sch. & Thonn.*—F.T.A. 2 : 118 ; Chev. Bot. 179. An undershrub up to 4–5 ft. high, densely silvery hairy, with small pale yellow flowers.
Common, chiefly in savannah region and open places. Extends to E. Sudan and Angola. Exsicc.—*T. Vogel* 111. *Barter* 541 ; 1783. *Sc. Elliot* 4258. *Poléguin* 461.
2. **T. uniflora** *Pers.* Syn. 2 : 329 ; Bak. f. Legum. Trop. Afr. 1 : 184. *T. anthylloides* Hochst.—F.T.A. 2 : 118 ; Chev. Bot. 179. *T. Apollinea* Guill. & Perr. *T. lathyroides* Guill. & Perr. An undershrub much branched from the base, often decumbent, grey-silky, with white flowers fading to pink.
French Sudan : Yatenga (Aug.) ! Macina. Senegal : Mbidjem ! Gold Coast : ? locality ! N. Nigeria : Sokoto (July) ! Extends to the Red Sea and Angola ; also in Cape Verde Islands. Exsicc.—*Heudelot* 214. *Perrottet* 221. *Brunner* 178. *Chev.* 24814.
3. **T. hirsuta** *Schum. & Thonn.* Beskr. Guin. Pl. 377. *T. pedicellata* Bak.—F.T.A. 2 : 117 ; Chev. Bot. 181. *T. ilorinensis* J. R. Drum. *ex* Bak. f. Legum. Trop. Afr. 1 : 184. A half-woody prostrate branched plant, with pink flowers on short slender pedicels.
French Sudan : Mossi, Ouagadougou to Ouahigouya (Aug.) ! Sierra Leone : Luseniya (fr. Dec.) ! Togo. N. Nigeria : Lokoja ! Kadaura (Sept.) ! Ilorin ! Benue R. ! Also in N. Cameroons. Exsicc.—*Barter* (no number). *Sc. Elliot* 4313. *Lely* 593.
4. **T. platycarpa** *Guill. & Perr.*—F.T.A. 2 : 109 : Bak. f. Legum. Trop. Afr. 1 : 187. *T. humilis* Guill. & Perr. —F.T.A. 2 : 109 ; Bak. f. l.c. Stems annual 6–12 in. high, woody at the base, thinly grey-silky, with pink or purple flowers.
Senegal : Mbidjem ! Cayor ! Gambia ! Togo. N. Nigeria : Bauchi Plateau, Naraguta and Jos (Sept.) ! Extends to E. Sudan. Exsicc.—*Heudelot* 363 ; 463. *Perrottet* 75. *Lely* 584.
5. **T. radicans** *Welw.*—F.T.A. 2 : 121 ; Bak. f. Legum. Trop. Afr. 1 : 214. Prostrate trailing much-branched herb, densely pubescent, with pink or purple flowers.
N. Nigeria : Bauchi Plateau, Vodni, 4,600 ft. (July) ! Also in Angola. Exsicc.—*Lely* 422.
6. **T. djalonica** *A. Chev.* Bot. 179 (name only). Prostrate with slender striate nearly glabrous stems and reddish-purple flowers.
French Guinea : Futa Jallon, between Timbo and Ditinn (Sept.) ! Exsicc. –*Chev.* 18447.
7. **T. digitata** *DC.* Prod. 2 : 255. *T. lupinifolia* var. β—F.T.A. 2 : 107. *T. lupinifolia* var. *digitata* Bak. f. Legum. Trop. Afr. 1 : 183. Wide-trailing slender grey-pubescent woody herb.
Senegal : Cape Verde (Feb.) ! Mbidjem (Oct.) ! Exsicc.—*Döllinger.*
8. **T. lupinifolia** *DC.*—F.T.A. 2 : 107, excl. var. β ; Bak. f. Legum. Trop. Afr. 1 : 183, excl. var. Wide-trailing perennial with hairy stems and pink flowers ; root tuberous according to Barter.
N. Nigeria : Jebba ! Nupe, buried in sand ! Extends to E. Sudan and Congo. Exsicc.—*Barter* 976.
9. **T. Vogelii** *Hook.f.*—F.T.A. 2 : 110 ; Bak. f. Legum. Trop. Afr. 1 : 209 ; Holl. 2 : 196 ; Chev. Bot. 181. An erect shrub 6–10 ft. high, clothed with dense yellowish or rusty tomentum ; flowers conspicuous, red or violet-purple, in dense racemes.
Common and often planted throughout tropical Africa, especially in West Africa. Exsicc.—*T. Vogel* 27 ; 28. *Ansell. Barter* 1083. *Irving* 96. *Sc. Elliot* 3989 ; 4207. *Millen* 140. *Dawodu. Macgregor* 181. *Elliott* 91. (See Appendix).
10. **T. densiflora** *Hook.f.*—F.T.A. 2 : 114 ; Bak. f. Legum. Trop. Afr. 1 : 203. *T. interrupta* A. Chev. Bot. 180, not of Steud. and Hochst. An undershrub like the last, with grey-pubescent striate branches ; fruits densely brownish-grey tomentose.
French Sudan : Damesa, near Baféné (Feb.) ! French Guinea : between Konkouré and Timbo (Mar.). N. Nigeria : Lokoja, Patti (Sept.) ! Jebba ! Bauchi Plateau, Naraguta (Aug.) ! Exsicc. –*T. Vogel* 169. *Barter* (no number). *Lely* 488. *Chev.* 325.
11. **T. Ansellii** *Hook. f.*—F.T.A. 2 : 115 ; Bak. f. Legum. Trop. Afr. 1 : 201 ; Chev. Bot. 179. An undershrub, low or sometimes reaching 5 ft. in height, silky grey or rusty hairy, with red-purple flowers in lax terminal or sometimes axillary racemes.
Common in savannah country ! N. Nigeria : Bauchi Plateau, 3,000–5,000 ft. ! S. Nigeria : Abeokuta ! Lagos ! Ilaro (Jan.) ! Exsicc.—*Ansell. T. Vogel* 110. *Irving* 104. *Millen* 109. *Chev.* 24856. *Poléguin* 561. *Schroeder* 109. *Warnecke* 246. (See Appendix).
12. **T. barbigera** *Welw.*—F.T.A. 2 : 113 ; Bak. f. Legum. Trop. Afr. 1 : 196. *T. polysperma* Bak.—F.T.A. l.c. Habit of the last ; branches with spreading tawny pubescence.
S. Nigeria : Lagos Colony ! Ala (fr. Nov.) ! Aguku ! Extends to E. Africa and Angola. Exsicc.—*Rowland. Thomas* 961 ; 1978.
13. **T. deflexa** *Bak.*—F.T.A. 2 : 111 ; Bak. f. Legum. Trop. Afr. 1 : 194. A woody erect undershrub, more or less thinly silky-pubescent, with leaflets and fruits deflexed.
Senegal : Bondou ! Exsicc.—*Heudelot* 194.
14. **T. bracteolata** *Guill. & Perr.*—F.T.A. 2 : 116 ; Bak. f. Legum. Trop. Afr. 1 : 201. *T. elongata* Hook. f., not of E. Mey. *T. fasciculata* Hook. f. *T. concinna* Bak.—F.T.A. 2 : 112 ; Bak. f. l.c. 190. *T. nigerica* Bak. f. l.c. 198. An erect branched undershrub, usually 2–3 ft. high, with long straight thinly silky branches and pink to purple flowers in long-stalked lax racemes.
Widely spread, especially in open country, in West Tropical Africa, extending to the Congo. (See Appendix).
15. **T. linearis** *Pers.*—F.T.A. 2 : 120 ; Bak. f. Legum. Trop. Afr. 1 : 189 ; Chev. Bot. 180. *T. pulchella* Hook. f. —F.T.A. 2 : 120 ; Bak. f. l.c. An erect perennial 1–3 ft. high, with slender grey-pubescent branches, very narrow leaflets and pink or orange-red flowers.
A common plant in open grassy and sandy waste places and farms. Extends to E. Africa and the Congo. (See Appendix).
16. **T. leptostachya** *DC.* Prodr. 2 : 251 ; Bak. f. Legum. Trop. Afr. 1 : 191. *T. purpurea* Bak.—F.T.A. 2 : 124, partly, not of Pers. Perennial erect, 1–2 ft. high, with subglabrous branches and pink to purple flowers ; chiefly in dry sandy regions.
Senegal : Walo ! Mbidjem ! Gambia ! Dahomey : Kotonu (Feb.) ! N. Nigeria : Sokoto (Sept., Oct.) ! Lake Chad (Feb.) ! Widely spread in tropical Africa.
17. **T. purpurea** *Pers.*—F.T.A. 2 : 124, partly ; Bak. f. Legum. Trop. Afr. 1 : 190 ; Holl. 2 : 195. *T. purpurea* var. *pubescens* Bak.—F.T.A. l.c. Much branched, decumbent or half erect, woody at the base, softly pubescent, with pink or purple flowers.
Gold Coast : Accra (Oct.) ! N. Nigeria : Katagum (Aug.) ! Sokoto (Sept., Dec.) ! Widely spread in tropical Africa. (See Appendix).
18. **T. mossiensis** *A. Chev.* in Bull. Soc. Bot. Fr. 57, Mém. 8 : 159 ; Chev. Bot. 180 ; Bak. f. Legum. Trop. Afr. 1 : 193. A branched woody undershrub, 3–6 f t. high, shortly tomentose ; flowers deep red in racemes 2–7 in. long.
French Sudan : Mossi, Mt. Zongapignié, in granite rocks (July) ! Gourma, rocks of Kodjar (July) ; Macina, rocks of Kanikambolé (Sept.). Exsicc. –*Chev.* 24414 ; 24646 ; 24844.
19. **T. Preussii** *Taub.* in Engl. Bot. Jahrb. 23 : 182. *T. Lelyi* Bak. f. Legum. Trop. Afr. 1 : 207. A robust erect undershrub, up to 5 ft. high, with striate pubescent stems and purplish or orange-red flowers.
N. Nigeria : Bauchi Plateau, Naraguta and Jos (Sept.) ! Vom, 3,000–4,500 ft. ! Cameroons Mt., between Buea and Mann's Spring, above the forest, 7,000 ft. (Jan.) ! Exsicc. —*Lely* 572. *Dent Young* 54. *Dunlap* 193. *Lehmbach* 63.
20. **T. gracilipes** *Guill. & Perr.* Tent. Fl. Seneg. 194, t. 49 ; F.T.A. 2 : 119 ; Bak. f. Legum. Trop. Afr. 1 : 189. An erect slender annual, 1 ft. or more high, thinly appressed grey-silky, with small purplish flowers.
Senegal : Bakel (Sept.-Oct.) ! Also in Abyssinia. Exsicc.—*Heudelot.*

24. MELLINIELLA Harms in Engl. Bot. Jahrb. 51 : 359 (1914).

Prostrate herb; stems glabrous or nearly so; leaves unifoliolate, broadly elliptic or elliptic-rounded, subcordate at the base, obtuse or rounded at the apex, 1–1·5 cm. long, 0·7–1·3 cm. broad, glabrous above, appressed-puberulous below, with 3–4 pairs of ascending nerves; stipules scarious, brownish, lanceolate, striate, acuminate, 4–6 mm. long; flowers arranged in dense several-flowered glomerules; calyx 4–5 mm. long, deeply 5-lobed, ciliate-pilose; corolla small; fruits lanceolate, compressed, about 1 cm. long, 5–8-seeded, puberulous .. .. *micrantha*

M. micrantha *Harms* l.c. 360, fig. 1.
French Guinea: Koulikoro (Oct.). Togo: Sausanne-Mangu (Sept.). Exsicc.—*Mellin* 121. *Cher.* 3235.

25. PSEUDARTHRIA W. & A.—F.T.A. 2 : 167.

Flowers arranged in short dense spike-like racemes about 2·5 cm. long; leaflets elliptic-obovate, rounded at the apex, the terminal one about 10 cm. long and 6 cm. broad, rather densely pubescent below, strongly nerved; stipules linear, about 8 mm. long; stipels subulate; calyx-lobes long-subulate, pilose; ovary densely villous; fruits several-seeded, about 2 cm. long, densely pilose .. .. .. 1. *confertiflora*

Flowers arranged in lax much-branched panicles:

Fruits 6–10-seeded, thinly pubescent; leaflets obovate, very undulate on the margin, the terminal one 9–10 cm. long and about 6 cm. broad, densely white-tomentose below, strongly nerved; stipules lanceolate, striate inside; calyx-lobes shortly subulate; ovary loosely pubescent .. .. 2. *Hookeri*

Fruits 1–3-seeded, shortly pubescent; leaflets loosely pubescent below, the terminal one rhomboid, mucronate, up to 13 cm. long and 8 cm. broad, undulate and strongly nerved; stipules, etc., as in *P. Hookeri* .. .. 3. *fagifolia*

1. **P. confertiflora** *Baker*—F.T.A. 2 : 167. An undershrub, 3 ft. high, with grooved yellowish-pubescent branches; flowers small purple.
Gold Coast: Jema, N. P. Ashanti (July)! Kratchi! S. Nigeria: Lagos (Aug.)! Extends to E. Sudan and East Africa. Exsicc.—*Krause. Macgregor* 151. *Foster* 115. *Chipp* 529.
2. **P. Hookeri** *W. & A.*—F.T.A. 2 : 168; Chev. Bot. 192. *P. alba* A. Chev. An erect, stiff-branched undershrub, 6–10 ft. high, grey-downy all over; flowers small in copious panicles, white, yellow or pink; sometimes gregarious in grass savannah.
French Sudan: Upper Volta. French Guinea: Fouébouédougou, near Beyla (July)! Togo: Misahöhe (Nov.)! N. Nigeria: Lokoja (Oct.)! Abinsi (fr. Dec.)! Bauchi Plateau, Naraguta and Jos (Sept.)! Tangale (Oct.)! S. Nigeria: Lagos! All over tropical Africa. Exsicc. *Macgregor* 141. *Parsons* 81. *Lely* 565; 657. *Collenette* 71. *Mildbraed* 7247. *Chev.* 22014; 22407.
3. **P. fagifolia** *Baker*—F.T.A. 2 : 167; Chev. Bot. 192. An erect undershrub, 3–4 ft. high, with deeply grooved branches, finely grey-silky above; flowers small, red, in slender panicles.
French Guinea: Kouria to Ymbo! Futa Jallon, Dalaba-Diaguissa Plateau! between Timbo and Ditinn! Sierra Leone! Nigeria: Yoruba country, without locality! Exsicc.—*Afzelius. Barter* 1600.

26. SESBANIA Pers.—F.T.A. 2 : 133; Phill. & Hutch. in Bothalia 1 : 40.

Appendages of claw of vexillum free from the claw in their upper half or third; stem and leaves glabrous or nearly so:

Inflorescence branched; peduncles smooth; leaves shorter than the inflorescence; leaflets 12–22 pairs, oblong-linear, mucronate, 1·2–2 cm. long, 3–5 mm. broad; pedicels slender, up to 2 cm. long; flower-buds obtuse; standard finely mottled with purple; fruits up to 24 cm. long, at first torulose .. .. 1. *punctata*

Inflorescence not branched; peduncles smooth; leaves about as long as the inflorescence; leaflets 9–27 pairs, oblong, up to 3 cm. long and 6 mm. broad; pedicels 0·5–1·5 cm. long; standard plain or mottled; fruits twisted, up to 14 cm. long, subterete, long-acuminate, transversely locellate .. .. .. 2. *aegyptiaca*

Appendages of vexillum wholly adnate to the claw or absent:

Flowers very large, 5–10 cm. long; fruits about 30 cm. long, flat; leaflets about 15–20 pairs, elongate-oblong, about 2·5–3 cm. long and up to 1 cm. broad; flowers very few, pink or red or cream-white .. .. 3. *grandiflora*

Flowers much smaller than above:

Stems and leaves or leaves only rather densely pubescent:

Pod not torulose, curved, about 15 cm. long, 3 mm. broad, with thick margins; leaflets 12–18 pairs, elongate-oblong, mucronate, up to 2·5 cm. long and 6 mm. broad; flower-buds beaked; standard not spotted .. .. 4. *pubescens*

Pod strongly torulose, about 20 cm. long; leaflets up to 40 pairs, linear-oblong, 0·8–2·5 cm. long, 2–3·5 mm. broad, silky-pubescent on both surfaces; flower-buds shortly acuminate; standard plain .. .. .. 5. *Dalzielii*

Stems and leaves glabrous or only slightly pubescent:

Appendages absent from the claw of the vexillum; fruits torulose, much constricted between the seeds, 12–15 cm. long; leaflets 8–18 pairs, narrowly oblong, 1–1·3 cm. long, about 3 mm. broad, finely punctate; standard striate .. 6. *leptocarpa*

Appendages present on the claw of the vexillum:

Margins of the fruits straight:

Fruits about 7 mm. broad ; seeds separated by partitions of the endocarp ; stems and leaf-rhachis never aculeate ; leaflets very numerous, linear-oblong, 1–2 cm. long, 3–5 mm. broad, minutely punctate ; standard densely mottled with dark spots .. .. 7. *pachycarpa*

Fruits 3 mm. thick ; seeds not separated ; stems and leaf-rhachis often aculeate ; leaflets about 30 pairs, about 1·5 cm. long and 3 mm. broad, glabrous and glaucous ; flowers few on a very short inflorescence ; standard yellow, spotted 8. *aculeata*

Margins of the fruits much constricted between the seeds ; leaflets up to 30 pairs, linear-oblong, about 1·5 cm. long and 3 mm. broad ; flowers 2–3 in each inflorescence ; standard finely mottled with purple .. .. .. 9. *arabica*

1. **Sesbania punctata** *DC.*—F.T.A. 2 : 133, partly ; Phill. & Hutch. in Bothalia 1 : 43 ; Holl. 2 : 198 ; Chev. Bot. 185. A shrub up to 10 or 12 ft. high, copiously branched, more or less pale glaucous, with yellow flowers ; common by streams and sandbanks.
French Sudan and Senegal to N. Nigeria ! (See Appendix).
2. **S. aegyptiaca** *Poir.*—F.T.A. 2 : 134 ; Phill. & Hutch. l.c. 44 ; Holl. 2 : 198 ; Chev. Bot. 184. *S. tchadica* A. Chev. Similar to the last.
Common all over tropical Africa ; also through tropical Asia to N. Australia, and in St. Helena. Exsicc.—*Perrottet*. *T. Vogel* 24 ; 45. *Talb.* 1242. (See Appendix).
Var. **bicolor** *W. & A.* ; standard petal entirely suffused with purple.
Senegal ! Also in E. Sudan, cultivated. Exsicc.—*Perrottet* 232.
3. **S. grandiflora** *Poir.*—Phill. & Hutch. l.c. 46. A small tree or shrub with rather stout branchlets pubescent when young.
Senegal ! Gold Coast : Axim ! Accra ! S. Nigeria : Lagos ! Widely cultivated in the tropics. Exsicc.—*Roger*. *Rowland*. *Chipp* 391. (See Appendix).
4. **S. pubescens** *DC.*—F.T.A. 2 : 135 ; Phill. & Hutch. l.c. 48 ; Chev. Bot. 184. A slender shrub of moist places ; inflorescence slender with rather small yellow flowers.
French Sudan : Timbuktu. Senegal : Mbidjem ! Galam ! Nboro ! Gold Coast : Accra (Feb.) ! Aburi (Aug.) ! Axim (Apr.) ! Dahomey : Kotonu ! Zagnanado, on banks of Lower Ouémé ! Also in Chad area, St. Thomas Island, Angola, Uganda and E. Africa. Exsicc.—*Roger* 23. *Heudelot* 252. *Perrottet* 228. *Brunner* 79. *Thierry* 72. *Brown* 419. *Johnson* 950. *Debeaux* 150.
5. **S. Dalzielii** *Phill. & Hutch.* in Bothalia 1 : 49. A slender shrub with weak slightly pubescent branches.
French Sudan : Koulikoro (Oct.) ! N. Nigeria : Jebba ! Katagum (Oct.) ! Abinsi (Oct.) ! Exsicc.—*Dalz.* 8 ; 614. *Barter* (no number). *Baikie* 9. *Chev.* 3390. (See Appendix).
6. **S. leptocarpa** *DC.*—F.T.A. 2 : 135, partly ; Phill. & Hutch. l.c. 50 ; Chev. Bot. 184. A glabrous undershrub, up to 8 ft. high.
French Sudan : Bilma ; banks of Bani R. ; Gourma ; Mossi. Senegal : Richard Tol (Dec.) ! St. Louis ! Walo ! French Guinea : Kouroussa ! Ivory Coast : Baoulé North, between Marabadiassa and Gottoro, in marshes. Exsicc.—*Roger*. *Heudelot* 489. *Perrottet* 233. *Poëguin* 441.
7. **S. pachycarpa** *DC.*—F.T.A. 2 : 134, partly ; Guill. & Perr. Tent. Fl. Seneg. 1 : 200, t. 50 ; Phill. & Hutch. l.c. 50 ; Chev. Bot. 184. Stem erect, soft and pithy, glabrous.
Senegal. French Guinea : Beyla (Mar.). N. Nigeria : Abinsi (Nov.) ! Katagum (Oct.) ! Bauchi Plateau. Naraguta and Jos (Aug.) ! Vom, 3,000-4,500 ft. ! Lake Chad ! Extends to E. Sudan and Nile Land. Abyssinia, Angola. Exsicc.—*Perrottet* 230. *E. Vogel* 79. *Dalz.* 9 ; 615. *Lely* 534 ; 586. *Dent Young* 85, (See Appendix).
8. **S. aculeata** *Pers.*—Phill. & Hutch. l.c. 50 ; Holl. 2 : 197. Stems glabrous, erect, branched from the base, often thick but soft and pithy, reaching 15 ft. in muddy swamps.
Senegal. Sierra Leone : Falaba ! Luseniya ! Gold Coast : Accra ! N. Nigeria : Lokoja ! S. Nigeria : Lagos (Dec.) ! Lagos Colony ! A common weed in the tropics. Exsicc.—*Perrottet* 229. *Sc. Elliot* 4219 ; 5220. *Dalz.* 1227. *Phillips* 13. (See Appendix).
9. **S. arabica** *Hochst.*—Phill. & Hutch. l.c. 51. Stems glabrous, sometimes very slender and decumbent.
N. Nigeria : Benue R., Muri Prov. (Nov.) ! Extends to E. Sudan and S. Arabia. Exsicc.—*Lamb* 69.

27. ASTRAGALUS Linn.—F.T.A. 2 : 137.

A small annual, with procumbent stems, clothed all over with appressed hairs ; leaves imparipinnate ; leaflets 5–6 pairs, oblong-oblanceolate, rounded at the apex, 5–8 mm. long, almost villous ; racemes axillary, about as long as the leaves ; flowers about 4 mm. long ; fruits turgid, about 6 mm. long and 3 mm. broad, appressed-pilose *Vogelii*

A. **Vogelii** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *A. prolixus* Sieb.—F.T.A. 2 : 138 ; Chev. Bot. 185. *Phaca Vogelii* Webb in Hook. Nig. Fl. 123, t. 8. Diffuse herb, woody at the base, with grey-hoary branches 1–2 ft. long.
Mauritania : N.W. Adrar, etc., common ! French Sudan : Bilma. Cape Verde Islands to Arabia. Exsicc. —*Schmitt* 28535 and *Ducellier* 28618 (ex *Herb. Chev.*).

28. REQUIENIA DC. in Ann. Sc. Nat. Ser. 1, 4 : 91 (1825).

A woody herb with rather long subsimple branches, up to 2–3 ft. long, covered all over with appressed whitish hairs ; leaves unifoliolate, broadly obovate, rounded or subcordate at the apex and sharply mucronate, cuneate at the base, 1·5–2·5 cm. long, 1–2 cm. broad, with 5–6 pairs of prominent looped lateral nerves ; petiole about 2 mm. long ; stipules subulate, 3 mm. long ; flowers axillary, solitary or paired, subsessile, 5–6 mm. long ; fruits ovoid, about 8 mm. long, villous, 1-seeded *obcordata*

R. **obcordata** *DC.* l.c. and Lég. Mém. 6, t. 37 ; Guill. & Perr. Tent. Fl. Seneg. 168. *Tephrosia obcordata* Bak.—F.T.A. 2 : 125.
French Sudan : Timbuktu, dunes (July) ! Senegal : Walo ! Mbidjem ! Bakel, etc. N. Nigeria : Sokoto, Arkila Hills (July) ! Extends to E. Sudan. Exsicc.—*Heudelot*. *Guillemin*. *Thierry* 65. *Dalz.* 336. *Chev.* 1264.

29. MICROCHARIS Benth.—F.T.A. 2 : 132.

A herb with slender pilose branches ; leaves unifoliolate ; leaflet lanceolate, acute, 3–5 cm. long, up to 1·5 cm. broad, laxly pilose with basifixed hairs ; stipules subulate, 5 mm. long ; flowers very small in slender axillary racemes ; pedicels 1·5 mm. long ; calyx pilose ; fruits linear, slightly falcate, 2 cm. long, laxly pilose, 8–10-seeded *tenella*

M. tenella *Benth.*—F.T.A. 2 : 132. A slender erect or diffuse herb, grey-hispid, with small red flowers.
N. Nigeria : Jebba ! Nupe, in crevices of rocks ! Bauchi Plateau, Vom, 3,000–4,500 ft. ! Exsicc. — *T. Vogel* 99. *Barter* 1601. *Dent Young* 51.

30. PSORALEA Linn.—F.T.A. 2 : 64.

A low shrub with rigid branchlets ; leaves pinnately trifoliolate ; leaflets oblanceolate or oblong, 1–1·5 cm. long, closely and minutely pubescent, glandular ; petiole short ; racemes axillary, stout ; calyx strongly nerved ; fruit as long as the calyx, ellipsoid, hairy, 1-seeded .. .. *plicata*

P. plicata *Del.*—F.T.A. 2 : 64. Undershrub up to 4 ft. high, with ribbed weakly spiny branchlets and whitish flowers.
N. Nigeria : Kuka, by Lake Chad. Extends to E. Sudan and Nile Land. Exsicc.—*E. Vogel* 33.

31. INDIGOFERA Linn.—F.T.A. 2 : 65.

Flowers in axillary spikes, racemes or stalked capitula :
*Leaflets on the main shoots more than 1 :
†Leaflets more than 2 :
Peduncles 1–2-flowered :
Stems shortly pubescent :
Fruits oblong-elliptic, about twice as long as the calyx, about 4 mm. long ; leaflets oblanceolate, rounded and mucronate at the apex, about 1 cm. long 1. *nigritana*
Fruits linear, 4–6 times as long as the calyx, about 0·8–1·3 cm. long ; leaflets rounded and mucronate at the apex, 1 cm. long .. .. 2. *geminata*
Stems long-pilose .. .. 10. *pilosa*
Peduncles more than 3-flowered, sometimes with leafy bracts :
Pedicels long and thread-like, spreading, much longer than the fruit :
Stems and leaflets very thinly pilose ; pedicels about 2 cm. long in fruit ; fruits oblong, shortly pubescent, 5–7 mm. long .. .. .. 3. *trichopoda*
Stems and leaflets rather densely pilose ; pedicels 1–1·5 cm. long in fruit ; fruits not seen .. .. 4. *nigricans*
Pedicels not as above, shorter than the fruit :
‡Leaves 5- or more-foliolate :
Flowers in dense strobiliform spikes with large broad overlapping bracts :
Stipules subulate ; inflorescences at first rather loose, shortly pubescent 34. *macrocalyx*

Stipules broadly ovate, about 1·5 cm. long ; inflorescences 5–6 cm. long, densely pilose .. .. 5. *strobilifera*
Flowers not in strobiliform spikes :
§Inflorescence spiciform or racemose (neither capitate nor subcapitate) :
Branches pilose with rather long weak spreading hairs or with gland-tipped hairs :
Hairs on the branches gland-tipped :
Inflorescence very few-flowered, not secund ; fruits linear, 1·5 cm. long, covered with gland-tipped hairs ; leaflets obovate, laxly covered with very long hairs .. .. 6. *viscosa*
Inflorescence many-flowered, becoming secund ; fruits 5–8 mm. long, densely setose ; leaflets obovate, covered with rather short hairs 7. *secundiflora*
Hairs on the branches not gland-tipped :
Inflorescence few-flowered, as long as or shorter than the leaves :
Leaflets oblong-obovate, about 5 mm. long .. .. .. 8. *Barteri*
Leaflets 1·5 cm. or more long :
Leaflets narrowly lanceolate .. .. 9. *djalonica*
Leaflets obovate or elliptic .. .. 10. *pilosa*
Inflorescence many-flowered, usually much longer than the leaves :
Fruits narrowly linear, 6–8-seeded, about 2 cm. long, hirsute-pilose ; branches and inflorescence covered with long brownish hairs 11. *hirsuta*
Fruits oblong-linear, 2–5-seeded, 1–1·5 cm. long ; branches and inflorescence covered with shorter whitish hairs .. .. .. 12. *astragalina*
Branches pubescent with short appressed medifixed hairs or glabrous, never glandular :

Fruits conspicuously sickle-shaped, soon becoming reflexed, about 2 cm. long, thinly pubescent; leaflets about 5–6 pairs, more or less oblanceolate, mucronate, 2–3·5 cm. long, thinly pubescent; racemes axillary, much shorter than the leaves .. .. 13. *suffruticosa*

Fruits straight or very nearly so, sometimes suborbicular:

Inflorescence very few-flowered (up to about 9 in each):

Fruits glabrous:

Fruits short and ovate-elliptic, 1-seeded, about 4 mm. long; leaflets obovate, 4–5 mm. long, glabrous, with very thick nerves; peduncles filiform, 2–2·5 cm. long.. .. .. 14. *Scarciesii*

Fruits linear, 4–9-seeded, about 1·5 cm. long; flowers subumbellate on a slender peduncle about 1·5 cm. long; branches pubescent or glabrous; leaflets few, slightly pubescent .. .. .. 15. *Heudelotii*

Fruits pubescent:

Stems prostrate; branches zigzag, sharply angular; leaflets about 5, oblanceolate, mucronate, 5–6 mm. long; fruits ovoid, whitish, 1-seeded 16. *Kerstingii*

Habit erect:

Leaflets 10–18 pairs; inflorescence as long as or longer than the leaves; peduncles long and slender; fruits linear, 3 cm. long 17. *dendroides*

Leaflets up to 7 pairs:

Inflorescence as long as or longer than the leaves; leaflets elliptic, mucronate, 2–2·5 cm. long .. .. 18. *costata*

Inflorescence much shorter than the leaves:

Terminal leaflet much longer than the lateral, linear-lanceolate, acute; fruits 2 cm. long .. .. 19. *parviflora*

Terminal leaflet slightly longer than the lateral, broadly oblanceolate; fruits under 1 cm. long .. .. 20. *heterocarpa*

Inflorescence with numerous flowers:

Valves of the fruit with 2 wing-like keels on the back; fruits about 4 cm. long, thinly appressed-setulose; leaflets numerous, oblanceolate or linear, mucronate, 2–4 cm. long, grey below; racemes much shorter than the leaves, with numerous filiform bracts .. .. 21. *stenophylla*

Valves of the fruit not winged, at most obtusely ridged:

Fruits shorter than the calyx; inflorescence terminating leafy lateral branchlets; sepals longer than the petals; leaflets 4–5 pairs, obovate, glabrous or nearly so .. .. 22. *terminalis*

Fruits longer than the calyx; inflorescence axillary:

Leaflets linear to oblanceolate:

Leaflets glabrous above, oblanceolate, 1·5–2·5 cm. long, not opposite; fruits very abruptly reflexed and crowded, acute, subquadrangular, 1·5 cm. long, acutely pointed .. .. .. 23. *endecaphylla*

Leaflets pubescent above:

Pods about 5 mm. long, shortly hirsute; inflorescence short and spike-like; leaflets 4–5 pairs, opposite, oblanceolate, shortly pubescent on both surfaces, punctate below .. .. .. 24. *microcarpa*

Pods 2 cm. or more long:

Pods flat, very narrowly linear, without thickened margins, 3 cm. long, showing the seeds prominently when dry; leaflets 2–3 pairs, lanceolate, 2–3 cm. long; inflorescence slender, much longer than the leaves .. .. 25. *aspera*

Pods subquadrangular or turgid or nearly flat and with thick margins:

Pods flat, 5 cm. long, with thick margins; leaflets 7–10 pairs 26. *Prieuriana*

Pods subterete, 2–2·5 cm. long, nearly glabrous; leaflets 5–8 pairs 27. *arrecta*

Leaflets obovate or elliptic:

Inflorescence much shorter than the leaves; leaflets 4–7 pairs:

Leaflets obovate, more or less truncate and mucronate, about 2 cm. long, more or less glaucous or bluish; fruits 3·5 cm. long, slightly pubescent .. .. 28. *tinctoria*

Leaflets elliptic, very acutely mucronate, 2·5 cm. long, 1–1·3 cm. broad, minutely pubescent below; flowers 8 mm. long 29. *emarginella*

Inflorescence longer than the leaves:

Inflorescence slender, pointed; leaflets 4–5 pairs, elliptic, mucronate, 2·5–4·5 cm. long, minutely pubescent below; fruits linear, reflexed, 3 cm. long, slightly pubescent .. .. .. 30. *macrophylla*

Inflorescence not pointed, short and broad ; leaflets about 5–6 pairs, obovate-elliptic, mucronate, 0·6–1·2 cm. long, strigose below ; fruits 1·5 cm. long, covered with glandular bristles 31. *atriceps*

§ Inflorescence capitate or subcapitate ; fruits very small and short :

Stipules foliaceous, ovate, 6–9 mm. long, very acutely acuminate ; leaflets 5, obovate, acute, 1 cm. long, densely silky-pilose ; fruits linear, mucronate, 5 mm. long, 4-seeded, silky .. .. 32. *sericea*

Stipules subulate :

Heads 3–5-flowered ; calyx-lobes with very dark-coloured hairs, more or less filiform ; leaflets 2–4 pairs, narrowly oblanceolate, 1–1·5 cm. long, thinly appressed-pilose below ; fruits short, brown-villous 33. *Dupuisii*

Heads with several to numerous flowers :

Heads more or less pyramidal or substrobiliform, with broad obovate acute foliaceous bracts ; leaflets about 7 pairs, broadly elliptic, about 1 cm. long and 6–7 mm. broad, thinly appressed-pilose on both sides ; fruits rounded, small, 1-seeded .. .. 34. *macrocalyx*

Heads subglobose or at most broadly ovoid :

Leaflets broadly obovate or elliptic-obovate, about 8 mm. long, 3–5 on main branches, often simple on branchlets ; fruits setulose, apiculate, 3 mm. long .. .. 35. *bracteolata*

Leaflets oblanceolate or oblong-oblanceolate, more or less acute :

Flowers mixed with large broad leafy bracts ; leaflets oblong-elliptic, 1·5 cm. long, very minutely pubescent ; fruits very short, hidden by the bracts .. .. 36. *congesta*

Flowers not mixed with leafy bracts, the latter more or less narrow and subulate :

Flowers in loose spike-like heads ; leaflets 1·5 cm. long, mucronate 37. *pulchra*

Flowers in broad cyme-like silky heads ; leaflets 2 cm. long 38. *capitata*

‡ Leaves on the main shoots usually 3-foliolate :

Leaflets linear or narrowly linear-lanceolate :

Fruits linear, subturgid, about 1·3 cm. long, thinly pilose ; inflorescence usually much longer than the leaves, few-flowered ; leaflets about 2·5 cm. long 39. *Welwitschii*

Fruits narrowly oblong, flat, about 1 cm. long, thinly appressed-pilose ; inflorescence about ½ as long again as the leaves ; leaflets 3–4 cm. long 40. *senegalensis*

Leaflets obovate to obovate-oblanceolate :

Stems and branches closely appressed-pubescent ; leaflets about 2 cm. long and 1 cm. broad, glaucous below, minutely pubescent on both surfaces ; racemes much longer than the leaves ; fruits torulose, curved, 1·5 cm. long 41. *oblongifolia*

Stems and branches clothed with long spreading hairs .. .. 10. *pilosa*

† Leaflets 2, very unequal-sized, the larger ovate-rhomboid, about 2·5 cm. long and 1·3 cm. broad, densely tomentose on both surfaces ; racemes short and subsessile ; fruits curved, long-beaked, about 1·3 cm. long, tomentose .. 42. *diphylla*

* Leaflets on the main shoots 1 to each leaf :

Fruits coarsely echinate on the back, short and falcate ; leaves subsessile, ovate or ovate-elliptic to obovate, 3–4 cm. long, 2–3 cm. broad, strigillose-pubescent especially near the margin ; stipules subulate-lanceolate, 6–7 mm. long ; inflorescence small and few-flowered .. .. 43. *echinata*

Fruits not echinate on the back ; leaves linear or linear-lanceolate :

Flowers in axillary racemes :

Fruits about 5 mm. long, twice as long as broad, shortly pubescent ; leaflet narrowly to broadly oblanceolate, rounded or subacute at the apex, 4–5 cm. long, glabrous above, minutely pubescent below .. .. 44. *procera*

Fruits about 2 cm. long or more :

Stems not winged :

Fruits soon becoming reflexed, subturgid, 1·5–2 cm. long, shortly appressed-pubescent ; stems short from a woody stock ; leaflet narrowly oblanceolate, mucronate, 3–6 cm. long, glabrous, minutely pubescent beneath .. 45. *Dalzielii*

Fruits not reflexed, linear, very minutely pubescent ; stems elongated ; leaflet linear or linear-lanceolate, up to 10 cm. long and 1·5 cm. broad, appressed-strigose .. .. 46. *simplicifolia*

Stems winged ; leaflet very narrow, 4–5 cm. long, appressed-strigose ; racemes 5–8 cm. long, few-flowered ; fruits 1·3 cm. long, tomentellous 47. *triulata*

Flowers in axillary pedunculate villous heads ; leaflet linear to lanceolate, acute, 3·5–6 cm. long, strigillose-scabrid ; fruits very short, villous .. 48. *polysphaera*

Flowers in sessile axillary more or less globose clusters or flowers solitary or subsolitary :
Flowers numerous in a dense sessile cluster ; bracts linear-subulate :
Leaflets broadly obovate, about 6 mm. long, appressed-villous ; stipules 6–7 mm. long .. .. 49. *dasycephala*
Leaflets narrowly obovate, 8 mm. long, shortly appressed-villous ; fruits linear, 8–10 mm. long .. .. 50. *sessiliflora*
Flowers few or solitary, shortly pedicellate ; leaves subtending the flowers often simple, the others up to 2–4 pairs, obovate, shortly pubescent ; fruits elliptic, very short, pubescent .. .. 35. *bracteolata*

1. **Indigofera nigritana** *Hook. f.*—F.T.A. 2 : 78 ; Bak. f. in Journ. Bot. 1903 : 194. Erect undershrub, 2–5 ft. high, with glabrous striate branchlets ; leaves on the main stem with 5–7 leaflets, simple on the flowering branchlets ; flowers very small, reddish.
French Sudan : Nyamina to Koulikoro (Oct.) ! . N. Nigeria : bank of the Niger (Sept.) ! Exsicc.—*T. Vogel* 7.
2. **I. geminata** *Bak.*—F.T.A. 2 : 81 ; Bak. f. l.c. 243 ; Chev. Bot. 173. Woody herb or low undershrub up to 2 ft. or more high, branchlets, leaves, etc., with appressed grey hairs ; leaflets usually 5–7 ; flowers delicate pink or red on slender pedicels.
French Sudan : Nyamina to Koulikoro (Oct.) ! San; Mossi, near Ouahigouya (Aug.) ! Ivory Coast : Morénou. N. Nigeria : Jebba ! Nupe ! Lokoja (Oct.) ! Bichikki (Sept.) ! S. Nigeria : Apapa (Nov.) ! Also in N.E. Tropical Africa. Exsicc.—*Barter* 966. *Dalz.* 20 ; 1221. *Lely* 629. *Chev.* 24772.
3. **I. trichopoda** *Lepr.* in Guill. & Perr. Tent. Fl. Senég. 177, t. 47 ; F.T.A. 2 : 78 ; Bak. f. l.c. 237. A slightly woody herb up to 3 ft. high, with small pink or purplish flowers ; leaves on the main stems with 7–9 leaflets.
Senegal : Bakel, etc. ! Mbidjem ! Exsicc.—*Leprieur. Heudelot* 272.
4. **I. nigricans** *Vahl.*—F.T.A. 2 : 78; Bak. f. l.c. 193. A woody herb, 1 ft. or more high, silvery-grey all over ; leaves on the main stem with 5–7 leaflets, 1–3 on the flowering branchlets.
N. Nigeria : banks of the Niger ! Exsicc.—*Baikie.*
5. **I. strobilifera** *Hochst.*—F.T.A. 2 : 75 ; Bak. f. l.c. 236. A low branched woody herb, 1 ft. or more high, all parts covered with loose pale brownish-silky pubescence ; flowering spikes 1–2 in. long and over ½ in. broad ; flowers small, deep red.
N. Nigeria : Sokoto, in waste fields (Jan.) ! Also in E. Sudan, Nile Land and East Africa. Exsicc.—*Dalz.* 330.
6. **I. viscosa** *Lam.*—F.T.A. 2 : 81 ; Bak. f. l.c. 242. Stems herbaceous, branched, 1–4 ft. high, half woody below ; flowers red.
Senegal ! N. Nigeria : Borgu ! Bauchi Plateau, Vom, 3,000–4,500 ft. ! Extends to Red Sea and E. and S. Tropical Africa. Exsicc.—*Lelièvre. Barter* 1051. *Dent Young* 47.
7. **I. secundiflora** *Poir.*—F.T.A. 2 : 94 ; Bak. f. l.c. 326 ; Chev. Bot. 177. An undershrub, more or less glandular, with greyish or sometimes rich brownish-purple pubescence ; flowers salmon-red ; fruits short, pubescent.
Senegal : several localities ! Sierra Leone. N. Nigeria : Sokoto (Nov.) ! Katagum (Dec.) ! Extends to E. Sudan, E. and S. Tropical Africa. Exsicc.—*Heudelot* 227. *Perrottet. Dalz.* 22. *Moiser* 45. (See Appendix).
8. **I. Barteri** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A small undershrub, laxly branched, 1 ft. or more high, grey with appressed hairs.
N. Nigeria : Nupe, in crevices of rocks after the rains. Jebba ! Exsicc.—*Barter* 951 ; 1604.
9. **I. djalonica** *A. Chev.* Bot. 173, name only. Erect, fairly stout undershrub, rather densely yellowish-grey pubescent.
French Guinea : Futa Jallon, between Dalaba and Diaguissa, 3,500–4,000 ft. (Sept.) ! N. Nigeria : Bauchi Plateau, Vom, 3,000–4,500 ft. ! Exsicc.—*Chev.* 18584. *Dent Young* 49.
10. **I. pilosa** *Poir.*—F.T.A. 2 : 82 ; Bak. f. l.c. 243. A woody undershrub 1–2 ft. high, branched from the base, loosely hairy ; flowers small, pink or purplish, solitary on slender pedicels or in usually few-flowered racemes ; fruits ¾–1 in. long, pilose.
Senegal. N. Nigeria : Nupe ! Sokoto, in waste places (Sept.) ! Katagum (Oct.) ! Bauchi Plateau, Naraguta and Jos (Aug.) ! Bichikki (Sept.) ! Vom ! Extends to Red Sea, E. and S. Tropical Africa. Exsicc. —*Barter* 977. *Dalz.* 31 ; 335. *Lely* 556 ; 628.
11. **I. hirsuta** *Linn.*—F.T.A. 2 : 88 ; Bak. f. l.c. 265 ; Stapf 593 ; Holl. 2 : 191 ; Chev. Bot. 174. Erect or decumbent, 2–3 ft. high ; flowers pink or deep red, the inflorescence coloured from golden-brown to dark blackish-brown ; a weed.
Widely spread in tropical Africa. (See Appendix).
12. **I. astragalina** *DC.*—F.T.A. 2 : 89 ; Bak. f. l.c. 266 ; Chev. Bot. 172. A hairy undershrub like the last ; flowers generally deep red, inflorescence greyish or light-golden-villous.
Senegal ! Ivory Coast : Mankono. N. Nigeria : Nupe ! Sokoto (Nov.) ! Katagum (Oct., Dec.) ! Bornu ! Extends to Nile Land and S. Tropical Africa. Exsicc.—*Roger. Heudelot* 411. *Barter* 867. *Dalz.* 27 ; 28. *Moiser* 54 ; 200.
13. **I. suffruticosa** *Mill.* Gard. Dict. ed. 8 : 2 ; Bak. f. l.c. 328. *I. Anil* Linn.—F.T.A. 2 : 98 ; Holl. 2 : 192 ; Stapf 593. A branched undershrub 3–5 ft. high ; flowers pale or deep red.
Widely spread in cultivation. (See Appendix).
14. **I. Scarciesii** *Sc. Elliot* in Journ. Linn. Soc. Bot. 30 : 76 ; Bak. f. l.c. 187. A small, half-woody herb, about 6 in. high, with smooth stems and red flowers.
Sierra Leone : Scarcies, near Buyabuya, on laterite (Feb.) ! Exsicc.—*Sc. Elliot* 4765.
15. **I. Heudelotii** *Benth.*—F.T.A. 2 : 85 ; Bak. f. l.c. 261. *I. Sofa* Sc. Elliot ; Bak. f. l.c. 240. A woody undershrub, up to 4 ft. or more high ; branchlets angled, pubescent at first ; flowers pink or red.
French Guinea : Rio Nunez ! Sierra Leone : several localities ! Liberia : Cinco (Nov.) ! Exsicc.—*Heudelot* 611. *Morson. Sc. Elliot* 4063 ; 4613 ; 4831 ; 5080 ; 5083 ; 5841. *Linder* 1553.
16. **I. Kerstingii** *Harms* in Engl. Bot. Jahrb. 45 : 308. A prostrate wayside herb, with small red flowers.
Togo : Sokode-Basari ! N. Nigeria : Lokoja (Oct.) ! Abinsi (July) ! Exsicc.—*Kersting* 586 ; A. 662. *Dalz.* 19 ; 580.
17. **I. dendroides** *Jacq.*—F.T.A. 2 : 100 ; Bak. f. l.c. 245 ; Chev. Bot. 173. *I. dalabaca* A. Chev. Bot. 172. *I. sesbanifolia* var. A. Chev. Bot. 177. Erect, branched, 2–3 ft. high, with slender wiry stems, very elegant foliage and red flowers.
Common in grassy land throughout the area and elsewhere in tropical Africa.
18. **I. costata** *Guill. & Perr.*—F.T.A. 2 : 95 ; Bak. f. l.c. 262.
Senegal. Also in E. Sudan. Exsicc.—*Perrottet.*
19. **I. parviflora** *Heyne*—F.T.A. 2 : 83 ; Bak. f. l.c. 260 ; Chev. Bot. 175. Erect, 1–2 ft. high, woody below, branched from the base, the branchlets angular, appressed grey-pubescent ; flowers pale purplish.
French Sudan : Macina (Sept.) ! Mossi Ouagadougou, Ouahigouya, etc. Senegal ! Extends to N.E. Tropical and E. Africa and Angola. Exsicc.—*Heudelot* 525. *Chev.* 24906. (See Appendix).
20. **I. heterocarpa** *Welw.*—F.T.A. 2 : 90 ; Bak. f. l.c. 324. Herbaceous, 1–2 ft. high, woody below, branched from the base ; flowers pink or purplish.
N. Nigeria : Lokoja (Sept.) ! Also in Angola. Exsicc.—*Parsons* 12.

21. **I. stenophylla** *Guill. & Perr.* Tent. Fl. Seneg. 188, t. 48 ; F.T.A. 2 : 83 ; Bak. f. l.c. 260 ; Chev. Bot. 177. Erect, sparingly branched undershrub, 1–3 ft. high ; inflorescence brownish-silky ; flowers light pink.
French Sudan : Gourma ; Mossi ; Macina. Senegal : Walo ! Galam ! Gambia : Albreda. French Guinea : Kouroussa (Aug.) ! N. Nigeria : Lokoja (Oct.) ! Jebba ! Abinsi (Sept.) ! Sokoto (Sept.) ! Bauchi Plateau, Panyam, 4,500 ft. (July) ! Yom, 3,000–4,500 ft. ! Extends to Abyssinia, E. Sudan and Uganda. Exsicc.—*Heudelot* 277. *Barter* 520. *Dalz.* 21 ; 622. *Poléguin* 395.

22. **I. terminalis** *Bak.*—F.T.A. 2 : 70 ; Bak. f. l.c. 187. A woody undershrub, 2–4 ft. high, with more or less angled brown-purple branches and small orange-red flowers, the corolla almost hidden by the calyx.
French Sudan : Kati (Jan.) ! Koulikoro. Senegal ! Ivory Coast : Toumodi. Exsicc.—*Heudelot* 365. *Chev.* 187.

23. **I. endecaphylla** *Jacq.*—F.T.A. 2 : 96 ; Bak. f. l.c. 327 ; Stapf 593 ; Holl. 2 : 191 ; Chev. Bot. 173. Suberect or prostrate herb, woody below, the stems appressed grey-pubescent, becoming glabrous ; flowers red in dense racemes.
French Sudan : Ségou. Liberia : Grand Bassa and Cape Palmas (July) ! Ivory Coast : Bingerville. Gold Coast : Achimota (June) ! Dahomey ! N. Nigeria : Bauchi Plateau ! S. Nigeria : Ebute Metta ! Widely spread in cultivation. Exsicc.—*T. Vogel* 4 ; 106. *Burton. Millen* 19. *Lely* 220. (See Appendix).

FIG. 146.—INDIGOFERA ARRECTA *Hochst.* (PAPILIONACEAE).

A, leaf-surface showing hairs. B, hair. C, inflorescence and leaf. D, flower. E, standard. F, wing petal. G, keel. H, flower with corolla removed. I, anther. J, pistil. K, fruiting branch. L, pod. M, seed.

24. **I. microcarpa** *Desv.* Journ. de Bot. 3 : 79 ; Bak. f. l.c. 327. *I. enneaphylla* Bak. F.T.A. 2 : 95, not of Linn. *I. Perrottetii* DC.—F.T.A. 2 : 94 ; Chev. Bot. 176. Suberect or prostrate grey-pubescent ; flowers small, pink ; fruits short, reflexed ; a plant of swampy ground.
French Sudan : Ségou (Sept.) ! Macina (Sept.) ! Fagulbine. Senegal : Walo ! Richard Tol ! N. Nigeria : Katagum (Oct.) ! Also in Angola. Exsicc.—*Heudelot. Perrottet. Dalz.* 56. *Chev.* 3230 ; 24930.

25. **I. aspera** *Perr.*—F.T.A. 2 : 102 ; Bak. f. l.c. 332 ; Chev. Bot. 172. Suberect, diffusely branched, hoary appressed-pubescent ; flowers pink.
French Sudan : Fereibo. Senegal : Richard Tol (June) ! Dahomey : Porto Novo (Jan.) ! N. Nigeria : Jebba ! Sokoto (Sept.) ! Also in E. Africa and Rhodesia. Exsicc.—*Döllinger* 61. *Heudelot* 428. *Barter* (no number). *Dalz.* 326.

26. **I. Prieuriana** *Guill. & Perr.*—F.T.A. 2 : 84 ; Bak. f. l.c. 261. Herbaceous or more or less woody, up to 18 in. high, with angled pubescent branchlets ; flowers red-purple in racemes nearly as long as the leaves.
Senegal : Galam ! N. Nigeria : Sokoto (Nov.) ! S. Nigeria : Lagos, on the Abeokuta road ! Exsicc.—*Heudelot. Millen* 69. *Dawodu* 290. *Moiser* 4.

27. **I. arrecta** *Hochst.*—F.T.A. 2 : 97 ; Bak. f. l.c. 329 ; Holl. 2 : 190. Erect, branched undershrub, with grooved grey-pubescent stems, rather glaucous foliage turning blackish in drying ; flowers small, purplish, in racemes shorter than the leaves.
Senegal ! Gambia ! N. and S. Nigeria : commonly cultivated ! Throughout tropical Africa. Exsicc.—*Heudelot* 686. *MacGregor* 144. *Elliott* 86. *Dudgeon* 9. *Johnson* (no number). *Dalz.* 57 ; 329 ; 329a. *Lamb* 98. (See Appendix).

28. **I. tinctoria** *Linn.*—F.T.A. 2 : 99 ; Bak. f. l.c. 329 ; Holl. 2 : 192 ; Chev. Bot. 178. Erect undershrub, 2–4 ft. high or more, like the preceding ; fruits straight or slightly curved.
Both wild and cultivated throughout the area ; widely spread in cultivation in the tropics. Exsicc.—*Roger. E. Vogel* 18. *Barter* (no number). *Johnson* 1074. *Dalz.* 58 ; 59 ; 327 ; 329b ; 1218. *Poléguin* 327. *Warnecke* 262. (See Appendix).

29. **I. emarginella** *Steud.*—F.T.A. 2 : 99 ; Bak. f. l.c. 330. A woody erect undershrub, 3–4 ft. high, with brown-pubescent ribbed branches ; flowers yellow, turning brown, in short dense axillary racemes.
N. Nigeria : Bauchi Plateau, Neill's Valley (June) ! Vom, 3,000–4,500 ft. ! Also in Abyssinia, Uganda, E. and S. Trop. Africa. Exsicc.—*Lely* 261. *Dent Young* 44.

30. **I. macrophylla** *Schum. & Thonn.*—F.T.A. 2 : 100 ; Bak. f. l.c. 330 ; Chev. Bot. 175. A scrambling or climbing shrub, with long racemes of pink or yellowish flowers.
Fairly common from Casamance to Nigeria ! Also in Angola (*vide* Baker). Exsicc.—*Heudelot* 603. *Barter* (no number). *Sc. Elliot* 4320 ; 5502. *Johnson* 470. *Dawodu* 267. *Millen* 54. *Talb.* 1307. *Linder* 887. *Warnecke* 425.

31. **I. atriceps** *Hook. f.*—F.T.A. 2 : 94 ; Bak. l.c. 326. A straggling half-woody herb or undershrub, 2–4 ft. high, with brown branchlets and red flowers in short dense black-pubescent racemes on peduncles 1–2 in. long.
Cameroons Mt., 7,000–9,000 ft. ! Exsicc.—*Mann* 1303; 2024. *Johnston* 68. *Dunlap* 208.

32. **I. sericea** *Benth.*—F.T.A. 2 : 76 ; Bak. f. l.c. 235. Erect, branched, woody below, pale brownish-silky ; corolla red, hidden by the calyx, flowers in numerous short close panicles crowded at the ends of the branchlets.
Senegal : Cayor, in sandy places ! Mbidjem ! N. Nigeria : Nupe ! Exsicc.—*Heudelot. Herb. Franqueville* 89. *Barter* 973. *Farmar* 73.

33. **I. Dupuisii** *Micheli* in Th. Dur. & De Wild. Mat. Fl. Cong. 1 : 9 ; Bak. f. l.c. 192. Herbaceous, half woody below, 1–2 ft. high ; flowers and fruits blackish-brown hairy ; corolla pink or salmon-red.
Gold Coast : near Accra (July) ! N. Nigeria : Abinsi (Oct.) ! Also in Congo region. Exsicc.—*Dalz.* 598. *Irvine* 735.

34. **I. macrocalyx** *Guill. & Perr.*—F.T.A. 2 : 71 ; Bak. f. l.c. 187 ; Chev. Bot. 174. Stems slender, branched, suberect or straggling ; flower-heads oblong, 1–1½ in. long, grey-silvery ; corolla orange-red.
French Sudan : Sicoro. Senegal : Bakel ! Casamance. Sierra Leone : Wallia, Scarcies R. (Feb.) ! N. Nigeria : Nupe ! S. Nigeria : Lagos Colony ! Also in N. Cameroons. Exsicc.—*Perrottet. Barter* 926 ; 998. *Millen* 174. *Sc. Elliot* 4270.

35. **I. bracteolata** *DC.*—F.T.A. 2 : 77 ; Bak. f. l.c 235 ; Chev. Bot. 172. *I. grisea* Bak.—F.T.A. 2 : 80. *I. leptoclada* Harms. A much-branched herb with a woody stock, grey-pubescent ; flowers small, salmon or orange-red ; in grass savannah.
French Sudan and Senegal, common ! N. Nigeria, common in grass lands. S. Nigeria : Abeokuta ! Extends to E. Sudan. Exsicc. –*Perrottet* 88. *Heudelot* 422. *Barter* 940 ; 945. *Irving. Dalz.* 22 ; 24. *Chev.* 651.

36. **I. congesta** *Welw.*—F.T.A. 2 : 70 ; Bak. f. l.c. 187. An undershrub up to 4 ft. high, with finely pubescent branchlets and scarlet flowers in dense axillary clusters.
Sierra Leone : Wallia, Scarcies R. (Feb.) ! Luseniya, Samu country (Dec.) ! Ivory Coast : Toumodi (Aug.) ! Togo : Misahöhe (Nov.) ! N. Nigeria : Ilorin ! S. Nigeria : Lagos Colony ! Onitsha ! Extends to E. Africa and Angola. Exsicc. –*Barter* 1791. *Sc. Elliot* 4252 ; 4308. *Punch* 1031. *Chev.* 22404. *Mildbraed* 7251.

37. **I. pulchra** *Willd.*—F.T.A. 2 : 76 ; Bak. f. l.c. 193 ; Holl. 2 : 192 ; Chev. Bot. 176. An erect undershrub, 2–5 ft. high, with stiff broom-like striate branches, grey-pubescent ; flower-clusters golden-tomentose ; corolla salmon or orange-red, scarcely exceeding the calyx.
Common in grass savannah from French Sudan to N. Nigeria ! S. Nigeria : Ebute Metta (Nov.) ! Lagos Colony (Aug.) ! Extends to E. Sudan and Angola. (See Appendix).

38. **I. capitata** *Kotschy*—F.T.A. 2 : 75 ; Bak. f. l.c. 236 ; Chev. Bot. 172. A woody herb or undershrub, 2 ft. or more high, with stiff slightly puberulous branches ; flowers small, red, in head-like clusters ¾–1 in. broad ; fruits very small, enclosed in the calyx, 1–2-seeded.
French Sudan : Ouacoro (Dec.) ! French Guinea : Rio Nunez ! Futa Jallon, Timbo to Ditinn. Sierra Leone : Wallia, Scarcies R. (Feb.) ! Luseniya, Samu country (Dec.) ! N. Nigeria : Lokoja (Oct.) ! Kadaura (Sept.) ! S. Nigeria : Lagos ! Extends to E. Sudan, Uganda and Angola. Exsicc.—*Heudelot* 642. *Sc. Elliot* 4063 ; 4245. *Dalz.* 24. *Lely* 596.

39. **I. Welwitschii** *Bak.*—F.T.A. 2 : 84 ; Bak. f. l.c. 261. A diffuse slender-branched annual, a few inches to 1 ft. high, sparsely pilose ; flowers very small, salmon-red.
N. Nigeria : Lokoja (Oct.) ! Also in Chad area and Angola. Exsicc.—*Parsons* 34.

40. **I. senegalensis** *Lam.*—F.T.A. 2 : 102 ; Bak. f. l.c. 333 ; Chev. Bot. 177. Herbaceous, erect or diffusely slender-branched, 1 ft. or more long, silvery-grey ; flowers small, pink in silky racemes.
French Sudan : Sébi. Senegal : Richard Tol, etc. (Aug.-Nov.) ! N. Nigeria : Sokoto (Dec.) ! Also in Chad area. Exsicc.—*Perrottet. Heudelot. Moiser* 252.

41. **I. oblongifolia** *Forsk.* Pl. Aeg.-Arab. 137 ; Bak. f. l.c. 265. *I. paucifolia* Del.—F.T.A. 2 : 88 ; Chev. Bot. 175. A stiff-branched undershrub, sometimes several feet high, grey glaucous or silvery ; leaflets 3–7 ; flowers scarlet, in many-flowered short-stalked racemes.
Mauritania : Adrar, etc. French Sudan and Senegal : common ! N. Nigeria : Sokoto (Nov.) ! Extends east to Arabia and S. Trop. Africa. Exsicc.—*Perrottet. Heudelot. Lelièvre. Dalz.* 328.

42. **I. diphylla** *Vent.* –F.T.A. 2 : 74 ; Bak. f. l.c. 235 ; Holl. 2 : 191 ; Chev. Bot. 173. *I. flavicans* Bak.—F.T.A. 2 : 73. A hoary undershrub, erect, 1–2 ft. high, or prostrate and spreading ; flowers red or bright pink, in dense oblong-conical racemes.
French Sudan and Senegal : common ! Togo : near Lome ! N. Nigeria : Sokoto (Nov.,Dec.) ! Katagum (July) ! Extends to E. Sudan and in S. Trop. Africa. Exsicc.—*Heudelot & others. Dalz.* 30. *Moiser* 15 ; 198. *Warnecke* 329.

43. **I. echinata** *Willd.*—F.T.A. 2 : 69 ; Bak. l.c. 186 ; Chev. Bot. 173. A prostrate herbaceous weed, with 2-angled or flattened pubescent stems and red or salmon-pink flowers.
French Sudan : Bobo-Dioulasso. Senegal ! French Guinea : Futa Jallon, Dalaba-Diaguissa. N. Nigeria : Nupe ! Zungeru (Oct.) ! Naraguta (Aug.) ! Kadaura (Sept.) ! S. Nigeria : Idah (Sept.) ! Onitsha ! Also in N. Cameroons and East Africa. Exsicc.—*Heudelot* 174. *T. Vogel* 57. *Barter* 1802. *Dalz.* 43. (See Appendix).

44. **I. procera** *Schum. & Thonn.*—F.T.A. 2 : 71 ; Bak. f. l.c. 188 ; Chev. Bot. 176. Erect branched undershrub, 2–6 ft. high, with ribbed branchlets greyish-pubescent when young ; flowers small, orange-red or scarlet.
Throughout the area and also in French Cameroons, Congo and Angola. Exsicc.—*Heudelot* 683. *T. Vogel* (no number). *Barter* 765. *Rowland. Millen* 99.

45. **I. Dalzielii** *Hutch.* in Kew Bull. 1921 : 246 ; Bak. f. Legum. Trop. Afr. 1 : 108. Herb, 6–18 in. high, with angle l flexuose finely pubescent branches, usually erect from a stout stock ; upper leaves sometimes 2- or 3-foliolate ; flowers deep pink, numerous, in erect pedunculate racemes.
N. Nigeria : Kontagora (Jan.) ! Zaria Province (Feb.) ! Bauchi Plateau : several localities ! Also in E. Shari. Exsicc.—*Dalz.* 27 ; 378. *Hill* 4. *Lely* 20 ; 188. *Carpenter. Dent Young* 42.

46. **I. simplicifolia** *Lam.*—F.T.A. 2 : 72 ; Bak. f. l.c. 190 ; Holl. 2 : 192. *I. Leprieurii* Bak. f. *I. tetrasperma* Schum. Erect stiffly branched undershrub, 2–5 ft. high, shortly grey-silky ; flowers pinkish, in short few-flowered axillary racemes.
Senegal ! Sierra Leone : Kambia (Dec.) ! Gold Coast : Accra Plains ! N. Nigeria : common in grass lands ! S. Nigeria : Idah (Sept.) ! Abeokuta ! Ibadan ! Aguku ! Extends to Angola and E. Africa. Exsicc.—*Heudelot* 196. *T. Vogel* 58 ; 94. *Barter* 1079 ; 1229. *Sc Elliot* 4198. *Rowland. Schlechter* 12333. (See Appendix).

47. **I. trialata** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8d : 157 ; Bot. 179 ; Bak. f. Legum. Trop. Afr. 105. Erect herb, 1–3 ft. high, woody at the base, with winged stems and light red flowers.
Ivory Coast : Baoulé Nord, Mt. Kangoroma, near Fétékro, and Middle Nzi Valley (July) ! Gold Coast : Ashanti, Dukwesein ! Exsicc.—*Chev.* 22173 ; 22182. *Chipp.* 618.

48. **I. polysphaera** *Bak.* in Kew Bull. 1895 : 65 ; Bak. f. l.c. 189. *I. baoulensis* A. Chev. Bot. 172. Erect branched undershrub, 2–4 ft. high, with harshly pubescent angled branches and rusty-brown flower-clusters ; corolla orange-red.
Ivory Coast : Baoulé Nord, between Bouaké and Langouassou (July) ! Gold Coast : Krobo Plains (Oct.) ! N. Nigeria : Lokoja (Oct.) ! Abinsi, abundant (Sept.) ! Tangale (Oct.) ! S. Nigeria : Lagos ! Extends to E. Sudan, Congo and Nyasaland. Exsicc.—*Johnson* 774. *MacGregor* 288. *Dalz.* 18 ; 594. *Lely* 658.

49. **I. dasycephala** *Bak. f.* Legum. Trop. Afr. 1 : 100. Erect, grey-pubescent branched woody herb, about 1 ft. high.
N. Nigeria : Denchira, Bauchi ! Also in N. Cameroons. Exsicc.—*Lely* 637.

50. **I. sessiliflora** *DC.*—F.T.A. 2 : 79 ; Bak. f. l.c. 238 ; Chev. Bot. 177. Erect or half-straggling woody undershrub, with hoary branches and foliage ; flowers pink, in round clusters.
French Sudan : Timbuktu (July) ! Senegal : several localities ! Also in Mauritania. Exsicc.—*Leprieur. Heudelot* 421.

32. CYAMOPSIS DC.—F.T.A. 2 : 65.

Stems pubescent ; leaves pinnate ; leaflets 3–7, subsessile, linear to oblanceolate, 1·5–3 cm. long, about 5 mm. broad, thinly silky with medifixed hairs below ; stipules subulate ; flowers in lax axillary racemes ; bracts small, linear ; calyx campanulate, 4 mm. long, the upper teeth broader and shorter than the lower ; corolla 5–7 mm. long, the standard petal shortest ; anthers subulate-apiculate ; fruit linear, 2·5–4 cm. long, about 5 mm. broad, finely appressed-setulose, about 6–9-seeded, beaked
senegalensis

C. senegalensis *Guill. & Perr.* Tent. Fl. Seneg. 1 : 171, t. 45 ; F.T.A. 2 : 65. Erect herb, woody at the base, with pinkish flowers.
Senegal : Dagana, in Walo district. Gambia : Albreda, in alluvium after inundation. Extends to Arabia and S.W. Africa.

33. ROTHIA Pers.—F.T.A. 2 : 7.

A small branched annual about 15 cm. high ; branches long-silky pubescent ; leaflets 3, subsessile, oblanceolate, acute, about 1·5 cm. long, silky-pilose on both sides ; flowers 2–5 in axillary clusters, subsessile ; calyx lobed to about the middle, 5 mm. long, lobes lanceolate ; corolla very short ; fruit sessile, 1–1·5 cm. long, silky-pilose, several-seeded .. .. *hirsuta*

R. hirsuta *Bak.*—F.T.A. 2 : 7. *Xerocarpus hirsutus* Guill. & Perr. Tent. Fl. Seneg. 169, t. 44. Erect or decumbent herb, with small pink or lilac flowers.
Senegal : Walo, on sandy hills (Aug.-Nov.) ! Extends to Abyssinia and the Red Sea, Mozambique and Angola. Exsicc.—*Leprieur.*

34. CROTALARIA Linn.—F.T.A. 2 : 7 ; E. G. Baker in Journ. Linn. Soc. 42 : 241.

*Leaves all trifoliolate or rarely a few also unifoliolate :
Stipules large and foliaceous, mostly falcate :
Stems weakly pilose with slender spreading hairs ; fruits long-stipitate, oblong, bladder-like, about 2·5 cm. long and 1 cm. broad, glabrous ; petiole as long as the leaflets, the latter oblong-lanceolate, acute, about 3 cm. long, thinly pilose on the midrib ; flowers 1·5 cm. long .. .. 1. *podocarpa*
Stems glabrescent or variously pubescent with appressed or more or less ascending hairs ; fruits not stipitate :
Stems and leaves rather roughly pilose-pubescent ; petiole nearly as long as the leaflets, the latter oblanceolate, conspicuously mucronate, 3–4 cm. long ; flowers 1·5 cm. long ; fruits densely ferruginous-tomentose, 2·5–3·5 cm. long .. 2. *lachnocarpa*
Stems and leaves very shortly and finely pubescent or glabrescent ; petiole as long as or longer than the leaflets, the latter variable, obovate to almost linear, mucronate or emarginate :
Flowers over 1 cm. long ; fruits 2·5–3 cm. long, very shortly pubescent
3. *cylindrocarpa*
Flowers usually under 1 cm. long ; fruits less than 2 cm. long, shortly pubescent
4. *goreensis*
Stipules small and subulate or obsolete :
Flowers axillary, solitary or few together, about 2 cm. long ; calyx-lobes narrowly lanceolate, acute, nearly 1 cm. long ; pedicels 1 cm. long, shortly pubescent ; keel bent below the middle ; petiole 5 cm. long ; leaflets obovate, mucronate, about 6 cm. long and 3·5 cm. broad, thinly pubescent below .. .. 5. *axillaris*
Flowers racemose or subspicate :
†Fruits more or less oblong, considerably longer than broad :
Leaves subsessile or very shortly petiolate ; flowers mostly more or less glomerate ; calyx rusty-tomentose :
Flowers about 3·5 cm. long, densely hirsute, the keel densely pubescent all over the outside ; leaflets oblong-oblanceolate, mucronate, 4–7 cm. long, up to 3 cm. broad, appressed-tomentose on both surfaces ; fruits 3–4 cm. long, densely villous .. .. 6. *lachnosema*

Flowers much smaller than above, rarely up to 2 cm. long :
Calyx 1·5–2 cm. long, enlarging in fruit ; lobes broadly lanceolate ; leaflets lanceolate, up to 5 cm. long and 2 cm. broad, thinly pilose below ; fruits shorter than the calyx, purplish-tomentose .. .. .. 7. *macrocalyx*
Calyx up to 1 cm. long ; lobes narrowly lanceolate to subulate :
Bracteoles linear-subulate, as long or nearly as long as the calyx-lobes and very similar to them ; calyx not enlarging in fruit :
Inflorescence subspiciform, longer than the subtending leaves ; calyx densely villous-pilose ; fruits about 8 mm. long, pilose at first .. 8. *atrorubens*
Inflorescence more or less globular, shorter than the subtending leaves ; calyx loosely pilose ; fruits glabrous, about 1 cm. long .. 9. *ononoides*
Bracteoles broader than above or much shorter than the calyx-lobes :
Inflorescence conical, with conspicuous broadly lanceolate flat bracts nearly

FIG. 147.—CROTALARIA STRIATA *DC.* (PAPILIONACEAE).
A, flowering shoot. B, standard. C, wing petal. D, pistil. E, fruits. F, seed.

1 cm. long ; calyx appressed-villous ; leaflets oblanceolate, 4–5 cm. long, pilose ; fruits silky, oblong-globose .. .. .. 10. *ebenoides*
Inflorescence short and glomerate, with linear bracts ; calyx villous ; leaflets lanceolate, acute, 2·5–5 cm. long, up to 1 cm. broad, appressed-pilose below ; fruits enclosed by the calyx, 1–4-seeded, villous .. .. 11. *Perrottetii*
Leaves with fairly long or long petioles :
Keel petals sharply bent from near the base ; stipules setaceous, conspicuous :
Flowers 2–3 in each inflorescence ; calyx-lobes broad and leafy, auriculate at the base ; leaflets obovate, rounded at the apex, about 3·5 cm. long and 2 cm. broad, thinly pilose on the nerves ; stipules filiform ; fruits stipitate, about 2 cm. long, pilose, bladder-like .. .. 12. *Quartiniana*
Flowers numerous on a usually elongated raceme ; calyx-lobes not auriculate, mucronate ; leaflets more or less as above but very shortly pubescent ; stipules short and subulate ; fruits oblong-ellipsoid, about 1·3 cm. long, softly pubescent .. .. 13. *senegalensi*
Keel gradually bent from about the middle ; stipules mostly obsolete :
Leaflets obovate, rounded at the apex :

Bracts small and deciduous; leaflets very laxly pubescent below; stipules obsolete:
Stems densely pilose with long weak hairs; keel not striate; fruits nearly straight, 3·5 cm. long .. .. 14. *incana*
Stems glabrous or nearly so:
Keel striate; fruits falcate, 3 cm. long, nearly glabrous .. 15. *falcata*
Keel not striate; fruits nearly straight, 2 cm. long .. 16. *obovata*
Bracts fairly large and persistent; leaflets closely pubescent below, narrowly obovate, 4–6 cm. long, about 2 cm. broad; stipules linear-subulate, 6 mm. long; racemes elongated, with very numerous crowded flowers 0·5–1 cm. long; flowers about 1·5 cm. long .. .. 17. *crepitans*
Leaflets more or less pointed or narrow:
Leaflets more or less rhomboid-obovate:
Keel with a chestnut-coloured blotch on each side; calyx densely silky-pubescent; leaflets rhomboid-obovate, about 5 cm. long and 3 cm. broad, shortly pubescent below .. .. 18. *naragutensis*
Keel not blotched:
Keel markedly striate; calyx shortly appressed-pubescent; leaflets obovate or rhomboid-elliptic, up to 15 cm. long and 6 cm. broad, shortly pubescent below; fruits straight, 3–3·5 cm. long, very slightly pubescent 19. *striata*
Keel not striate; calyx thinly pubescent; leaflets rhomboid-elliptic, acute, 2·5–5 cm. long, up to 2·5 cm. broad, very loosely pubescent below; fruits 3 cm. long, bladder-like, thin, transversely nerved, loosely pilose 20. *Doniana*
Leaflets linear or lanceolate:
Flowers not over 1 cm. long, crowded; leaflets linear or linear-lanceolate, rounded and mucronate at the apex, up to 6 cm. long, glaucous, nearly glabrous; fruits 2–4 cm. long, minutely pubescent .. 21. *astragalina*
Flowers about 2·5 cm. long, laxly arranged, the keel acutely beaked; leaflets linear-lanceolate, up to 17 cm. long and 2 cm. broad, shortly pubescent below; fruits about 5 cm. long and 1 cm. broad, soon glabrous 22. *intermedia*
†Fruits globose or subglobose, very small and about as broad as long or if oblong then very short:
Flowers solitary or up to 3 or 4 in a cluster; leaves sessile; leaflets oblanceolate, up to 1·5 cm. long, long-pilose below; fruits weakly pilose .. 23. *microcarpa*
Flowers numerous in a raceme:
Flowers very crowded in a short broadly pyramidal head-like raceme scarcely exserted from the upper leaves; leaflets narrowly oblanceolate, the lateral one falcate, mucronate, up to 4 cm. long; petiole villous; fruits subglobose, about 7 mm. long, villous-tomentose .. .. 24. *cephalotes*
Flowers in racemes well exserted from the leaves:
Racemes lax and slender:
Stems numerous from a woody rhizome, short and straight; racemes several and short, slender, leaflets oblanceolate .. .. .. 25. *graminicola*
Stems from an annual root, very flexuous and much-branched; racemes leaf-opposed, with numerous flowers; leaflets obovate to linear-oblanceolate 26. *sphaerocarpa*
Racemes short and densely flowered, subspicate; other characters as above 11. *Perrottetii*
*Leaves all unifoliolate:
Flowers axillary or in extremely short racemes about ¼ as long as the leaves:
Flowers solitary; calyx large, as long as and enveloping the corolla; leaflet subsessile, linear to obovate-oblanceolate, mucronate, up to 12 cm. long, silky-pilose below; fruits 2 cm. long, glabrous, surrounded by the densely pilose persistent calyx .. .. 27. *calycina*
Flowers few together; calyx small, not enveloping the corolla; leaflet oblanceolate, about 3 cm. long, shortly pubescent; fruits 8 mm. long, glabrous 28. *polyguloides*
Flowers racemose:
Racemes very densely flowered, overtopped by the leaves; bracts setaceous, long and conspicuous; leaflet petiolate, lanceolate, mucronate, 4–8 cm. long, densely appressed-pilose below; petals very striate .. .. .. 29. *anthyllopsis*
Racemes lax, overtopping the leaves:
Stipules foliaceous, amplexicaul; leaflet broadly obovate, emarginate, about 4·5 cm. long and 2–3 cm. broad, very shortly pubescent below; peduncle angular; flowers glabrous; fruits 2·5 cm. long .. .. 30. *verrucosa*
Stipules absent or very small or subulate:
Leaflet oblanceolate or obovate-oblanceolate, rounded or retuse at the apex, 4–7

cm. long, 1·5–2·5 cm. broad, minutely and rather closely pubescent below; flowers numerous in stiff racemes; calyx thinly puberulous; fruits 4·5 cm. long, glabrous .. .. 31. *retusa*

Leaflet linear to elliptic, broadest in the middle:

Leaflet elliptic, sessile, about 1·5 cm. long and 8 mm. broad, pilose on both surfaces, thick; racemes very few-flowered; flowers about 1 cm. long; fruit 1 cm. long, densely pilose .. .. 32. *arenaria*

Leaflet linear to linear-lanceolate, acute:

Glabrous or nearly so; leaflet linear, mucronate, 3·5–5 cm. long, subsessile; flowers about 1·5 cm. long, very few in slender racemes; pedicels 1 cm. long; fruits 2 cm. long, cylindric:

Carina rounded, not beaked .. .. 33. *glauca*

Carina narrowly beaked, striate .. .. 34. *spartea*

Long-pilose or densely pubescent:

Stems tall and very slender; leaflet linear, pilose mainly on the margins; racemes slender, with fairly numerous lax flowers; fruits cylindric, 1 cm. long .. .. 35. *Vogelii*

Stems very short, a few cm. high; leaflet linear, appressed-pilose all over; racemes short and very few-flowered; fruits 7–8 mm. long

36. *bongensis*

1. **Crotalaria podocarpa** *DC.*—F.T.A. 2 : 17; Bak. f. in Journ. Linn. Soc. 42 : 406; Chev. Bot. 169. An erect branched herb, 1–2 ft. high.
French Sudan: Sompi. Senegal: Mbidjem, Richard Tol and vicinity! Widely spread in tropical Africa. Exsicc.—*Herb. Franqueville* No. 45.
2. **C. lachnocarpa** *Hochst.*—F.T.A. 2 : 33; Bak. f. l.c. 404; Chev. Bot. 169. A bushy plant 3–6 ft. high, clothed with brown hairs.
French Sudan. S. Nigeria: Lagos, Ibadan Road! Okwoga (Sept.)! Widely spread in tropical Africa. Exsicc.—*Millen* 110. *Foster* 340. *Farquhar* 69.
3. **C. cylindrocarpa** *DC.*—F.T.A. 2 : 40; Bak. f. l.c. 414. Erect branched, woody below, 1–2 ft. high.
Senegal: Richard Tol, etc. (Oct.-Jan.)! N. Nigeria: Sokoto (Sept., Nov.)! Naraguta (Aug.)! Extends to Rhodesia. Exsicc.—*Roger. Dalz.* 343. *Lely* 148; 480. (See Appendix).
4. **C. goreensis** *Guill. & Perr.*—F.T.A. 2 : 28; Bak. f. l.c. 413; Chev. Bot. 169. Stems herbaceous, woody below, or an undershrub up to 5 ft. high, finely pubescent; flowers yellow turning reddish.
Throughout the area and over most of tropical Africa. (See Appendix).
5. **C. axillaris** *Dryand.*—Bak. f. l.c. 388. *C. lotifolia* Bak.—F.T.A. 2 : 42, not of Linn. An erect undershrub, shortly silky-pubescent.
Gold Coast: Cape Coast (July)! Guinea, without locality! Various parts of tropical Africa and in the West Indies. Exsicc.—*T. Vogel* 91.
6. **C. lachnosema** *Stapf* in Kew Bull. 1910 : 329; Bak. f. l.c. 323. A woody undershrub, 3–6 ft. high, more or less fulvous-tomentose all over; flowers yellow and orange-streaked.
Liberia: Kakatown! Togo. N. Nigeria: Nupe! Lokoja (Oct.)! Kontagora (Nov.)! Bauchi Plateau; Naraguta! Ropp, 4,600 ft. (July)! Vom! Also in Cameroons. Exsicc.—*Barter* 920. *Whyte. Dalz.* 39. *Lely* 51; 455. *Dent Young* 36.
7. **C. macrocalyx** *Benth.*—F.T.A. 2 : 20; Bak. f. l.c. 306. Erect or procumbent, 1–2 ft. high, woody below, shortly and closely pubescent; flowers yellow to orange, crowded at the ends of the branches.
Senegal! Togo: Atakpame (Nov.)! Chra River. N. Nigeria: common! S. Nigeria: Ogbomawshaw! also in Abyssinia. Exsicc.—*Heudelot* 209. *Barter* 959; 990. *Rowland. Dal.* 16; 595. (See Appendix).
8. **C. atrorubens** *Hochst.* ex *Benth.*—F.T.A. 2 : 22; Bak. f. l.c. 307, t. 11A; Chev. Bot. 168. *Chrysocalyx rubiginosa* Guill. & Perr., not *Crotalaria rubiginosa* Willd. Erect or suberect, 1–3 ft. high, woody below, yellowish silky-hairy; flowers yellow or reddish tinged, densely crowded at the ends of the branches.
French Sudan: Ségou. Senegal: Gambia! N. Nigeria: Nupe! Jebba! Sokoto (Sept.)! Katagum (Sept.)! Extends to E. Sudan. Exsicc.—*Barter* 1052. *Dalz.* 18; 345. (See Appendix).
9. **C. ononoides** *Benth.*—F.T.A. 2 : 22; Bak. f. l.c. 307. Herb, woody at the base, 1–4 ft. high, suberect, the lower branches often procumbent, brownish silky-hairy; flowers yellow or reddish in heads at the ends of the branches.
Sierra Leone! N. Nigeria: Sokoto (Nov.)! Bauchi Plateau: Naraguta and Jos (Sept.)! Vom! Extends to E. Africa and Rhodesia. Exsicc.—*Afzelius. G. Don. Lely* 559. *Dent Young* 38. *Moiser* 75.
10. **C. ebenoides** *Walp.*—F.T.A. 2 : 20; Bak. f. l.c. 306; Chev. Bot. 168. Erect herb 12–18 in. high, with long slender branches, densely brown-silky; flowers in dense oblong terminal heads.
French Sudan: Koulikoro (Oct.)! Senegal: Galam to the Sahara! Exsicc.—*Heudelot* 253. *Chev.* 3197.
11. **C. Perrottetii** *DC.*—F.T.A. 2 : 19; Bak. f. l.c. 305, t. 11B. *C. gracilis* Walp.—F.T.A. 2 : 20; Bak. f. l.c. 306. *C. gambica* Taub. Herb 1–2 ft. high, with more or less straggling branches, brownish-silky; flowers yellow turning red.
Senegal: Cayor, etc.! Gambia: Cape St. Mary! Kudang (Jan.)! Gold Coast: Salaga! N. Nigeria: Kadaura (Sept.)! Exsicc.—*Perrottet. Heudelot* 409. *Ingram. Brown-Lester* 28; 53; 65. *Krause. Lely* 598. *Dalz.* 8023; 8024.
12. **C. Quartiniana** *A. Rich.*—F.T.A. 2 : 42; Bak. f. l.c. 389. Herb with prostrate branches, 1–2 ft. long, thinly hairy; flowers fairly large, yellow.
N. Nigeria: Sokoto (Sept.)! Katagum (Sept.)! Ako (Oct.)! Bornu! Also in Abyssinia. Exsicc.—*Dalz.* 13; 342. *Lely* 651.
13. **C. senegalensis** *Bucle*—F.T.A. 2 : 31; Bak. f. l.c. 337. *C. maxillaris* Bak. f. l.c., partly. Suberect or prostrate, half woody, 1–2 ft. high, shortly pale-pubescent; flowers yellow turning orange.
Senegal! N. Nigeria: Sokoto (Sept.)! Common in fields, etc. Katagum (Oct.)! Widely spread in tropical Africa. Exsicc.—*Roger. Heudelot* 113. *Brunner* 30. *Dalz.* 12; 340. (See Appendix).
14. **C. incana** *Linn.*—F.T.A. 2 : 31; Bak. f. l.c. 357. Herbaceous, woody below, 2–4 ft. high, with coarsely hairy stems and fruits.
Sierra Leone! (probably introduced). Also in Abyssinia and E. Africa, and in the tropics generally. Exsicc.—*G. Don.*
15. **C. falcata** *Vahl*—F.T.A. 2 : 40; Bak. f. l.c. 344; Stapf 592; Holl. 2 : 181; Chev. Bot. 168. Shrubby, diffusely branched, 2–3 ft. high, shortly silky-pubescent above; flowers yellow, purple-veined, in long-stalked racemes.
French Guinea: between Ymbo and Kouria, in the bush (Oct.). Liberia: Bassa Cove! Cape Palmas (July)! Cinco! Gold Coast: Accra (Oct.)! Togo: Lome! Dahomey: Kotonu (Mar.)! N. Nigeria: Sokoto! S. Nigeria: Lagos (Oct.)! Also in Congo region. Exsicc.—*T. Vogel* 16. *Ansell. Moloney. Brown* 400. *Warnecke* 89. *Debeaux* 171. *Linder* 1545. (See Appendix).

16. **C. obovata** *G. Don*—Gen. Syst. 2 : 138 ; Bak. f. l.c. 345. Erect branched undershrub, shortly pale-pubescent ; flowers yellow, in rather long crowded racemes.
Gold Coast : Accra ! N. Nigeria : Sokoto (Sept.) ! Common in fields and waste places. Katagum (Sept.) ! Exsicc.—*Dalz.* 19 ; 341. *Lely* 157. (See Appendix).

17. **C. crepitans** *Hutch.* in Kew Bull. 1921 : 363. Erect herb or undershrub, 3 ft. high, with ribbed stems, shortly brownish-pubescent ; flowers yellow, strongly brown-purple striped.
N. Nigeria : Bauchi Plateau, between Hepham and Ropp, 4,600 ft. (July) ! Exsicc.—*Lely* 378.

18. **C. naragutensis** *Hutch.* l.c. A woody undershrub, 3–6 ft. high, softly grey-tomentellous ; flowers yellow, in long-stalked racemes up to a foot or more long.
N. Nigeria : Sokoto (Nov.) ! Bauchi Plateau, Naraguta (Aug.) ! Kadaura (Sept.) ! Exsicc.—*Lely* 490; 601. *Moiser* 64. (See Appendix).

19. **C. striata** *DC.*—F.T.A. 2 : 38 ; Holl. 2 : 185 ; Chev. Bot. 170. Erect undershrub, 3–6 ft. high, grey or yellowish-silky on the young parts ; flowers yellow, purple-striped, in fairly dense racemes 6–10 in. long.
French-Sudan : Mossi. Gambia ! Liberia : Moylakwelli (Oct.) ! Ivory Coast ! Bliéron, at the mouth of Cavally R. ; between Beriby and Tabou. Gold Coast : Akropong (Oct.) ! Atuntumbrim (Oct.) ! Dahomey : Kotonu, near the lagoon. N. Nigeria : Jebba ! Lokoja (Oct.) ! Yola (Sept.) ! Bauchi Plateau, Naraguta and Jos (Sept.) ! S. Nigeria : Iddo Island, Lagos (Dec.) ! Lagos Island ! Idumuye (Dec.) ! Common over most of tropical Africa and tropical Asia. Exsicc.—*Barter* (no number). *Millen* 49. *Brown-Lester* 43. *Johnson* 801. *Dawodu* 34. *Dalz.* 304. *Lely* 580. *Linder* 1267. (See Appendix).

20. **C. Doniana** *Bak.*—F.T.A. 2 : 28. A herbaceous undershrub, laxly branched, thinly pubescent ; flowers yellow, in few-flowered axillary racemes.
Sierra Leone : Samu country (fr. Dec.) ! S. Nigeria : Oban ! Eket ! Also in French Cameroons. Exsicc. —*Don. Sc. Elliot* 4380. *Talb.* 1310 ; 3012.

21. **C. astragalina** *Hochst.*—F.T.A. 2 : 43 ; Bak. f. l.c. 374 ; Chev. Bot. 168. Herb, woody at the base, with slender branches, erect or more or less diffuse, shortly silky-pubescent above ; flowers rather small, yellow with dark purple lines, in dense short lateral or terminal racemes, usually long-stalked. (See Appendix).
Senegal : Niayes ; Casamance ; Dakar, Cape Verde ! Gambia ! Sierra Leone : Mahela (Dec.) ! Tambakka country (fr. Feb.) ! Liberia : Duport (Nov.) ! N. Nigeria : Bauchi Plateau, Nabardo (Sept.) ! Vom, 3,000–4,500 ft. ! Also in North-East and East Tropical Africa. Exsicc.—*Sc. Elliot* 3937 ; 5049. *Brown-Lester* 17. *Lely* 617. *Linder* 1490.

22. **C. intermedia** *Kotschy.*—F.T.A. 2 : 37 ; Bak. f. l.c. 327 ; Chev. Bot. 169. An erect undershrub, 3–4 ft. high, with ribbed branches, shortly appressed-pubescent ; flowers fairly large, whitish or pale yellow with dark purple veining, in long terminal racemes ; usually in wet places.
French Sudan : San. Senegal : Mbidjem. Sierra Leone : Layah, Scarcies R. ! Liberia : Kakatown ! Ivory Coast : between Marabadiassa and Gottoro ; near Nzi. N. Nigeria : Sokoto (Oct.) ! Muri Prov. (Nov.) ! Yola (Oct.) ! Bauchi Plateau, Naraguta and Jos (Sept.) ! S. Nigeria : Lagos ! Aguku ! Widely spread in tropical Africa. Exsicc.—*Sc. Elliot* 4483. *Millen* 98. *Whyte. Dalz.* 339. *Lely* 576. (See Appendix).

23. **C. microcarpa** *Hochst.*—F.T.A. 2 : 16 ; Bak. f. l.c. 402 ; Chev. Bot. 169. A diffusely branching herb, woody at the base, from a few inches to a foot or more long, brownish-silky ; flowers very small, yellow.
French Sudan : San. N. Nigeria : Nupe ! Lokoja (Oct.) ! Sokoto (Sept., Nov.) ! Kontagora ! Katagum (Oct.) ! Yola (Aug.) ! Extends to East Tropical Africa and Rhodesia. Exsicc.—*Barter* 997. *Dalz.* 17 ; 301 ; 346.

24. **C. cephalotes** *Steud.*—F.T.A. 2 : 23 ; Bak. f. l.c. 276. A slightly woody herb, 6–18 in. high, often unbranched, densely silky ; flowers small, yellow ; in rocky places.
N. Nigeria : Nupe ! Lokoja, Mt. Patti (Nov.) ! Ilorin, Aguji (Oct.) ! Over tropical Africa to Transvaal. Exsicc.—*Barter* 801. *Dalz.* 13. *Thornton.*

25. **C. graminicola** *Taub.* ex *Bak. f.* l.c. 291. A low shrublet, 6–18 in. high, grey pubescent ; flowers bright yellow, red-veined.
Senegal ! French Guinea : Rio Nunez ! Sierra Leone : Ruka to Kitchom (Dec.) ! N. Nigeria : Kontagora (Jan.) ! Sokoto (Dec.) ! Zaria (Feb.) ! Bauchi Plateau, Naraguta (May) ! Jos (Mar.) ! Vom, 3,000–4,500 ft. Also in N. Cameroons. Exsicc.—*Heudelot* 614. *Sc. Elliot* 4310. *Dalz.* 40 ; 377. *Lely* 53 ; 238. *Hill* 3.

26. **C. sphaerocarpa** *Perr.* ex *DC.*—F.T.A. 2 : 23 ; Bak. f. l.c. 289 ; Chev. Bot. 170. A diffusely branched herb, up to 1 ft. or more long, slightly pubescent ; flowers yellow, in lax racemes.
French Sudan : Bamako (Jan.) ! Senegal : Cayor, etc. ! Mbidjem ! Cape Verde ! Casamance. French Guinea : Kouria (Oct.) ; Bowall (Nov.) ; Farana (Feb.). Sierra Leone. Extends to E. Sudan and East Africa. Exsicc.—*Roger. Heudelot* 483. *Thierry.*

27. **C. calycina** *Schrank*—F.T.A. 2 : 15 ; Bak. f. l.c. 271 ; Chev. Bot. 168. Erect herb, simple or with few branches, densely brown-silky ; flowers few, about 1 in. long, the calyx very hairy on the outside, the corolla yellow ; fruits glabrous, about as long as the calyx.
French Sudan : Koulikoro ; San. Senegal ! French Guinea : Kouroussa ! Sierra Leone : Luseniya (Dec.) ! N. Nigeria : Yola (July) ! Liruwen-Kano Hills ! Widely spread in tropical Africa and Asia, also in N. Australia. Exsicc.—*Heudelot* 119. *Sc. Elliot* 4066. *Dalz.* 1. *Carpenter. Pobéguin* 460.

28. **C. polygaloides** *Welw.*—F.T.A. 2 : 15 ; Bak. f. l.c. 255. Branched herb, 1 ft. high ; flowers pale yellow.
Sierra Leone : Wallia ! Extends to Upper Ubangi and Angola. Exsicc.—*Sc. Elliot* 4280.

29. **C. anthyllopsis** *Welw.*—F.T.A. 2 : 15 ; Bak. f. l.c. 263. A branched herb, woody below, 1 ft. or more high, more or less diffuse, brownish-pilose ; flowers yellow or purplish with darker veining.
N. Nigeria : Bauchi Plateau, Naraguta and Jos (Sept.) ! Vom, 3,000–4,500 ft. ! Extends to Nile Land, East Africa, Rhodesia, and to Angola. Exsicc.—*Lely* 564. *Dent Young* 33.

30. **C. verrucosa** *Linn.*—F.T.A. 2 : 14 ; Bak. f. l.c. 254 ; Holl. 2 : 185. Erect, 2–3 ft. high, with angular branches ; flowers greenish-yellowish white, blue-streaked, in leaf-opposed and terminal racemes.
Sierra Leone : Freetown ! S. Nigeria : Calabar ! Widely spread in the tropics. Exsicc.—*Welwitsch* 1940. *Milne.* (See Appendix).

31. **C. retusa** *Linn.*—F.T.A. 2 : 13 ; Bak. f. l.c. 270 ; Stapf 592 ; Holl. 2 : 185 ; Chev. Bot. 170. A half-shrubby herb, 2–4 ft. high ; flowers conspicuous, in long loose racemes, ½–1 in. long, yellow with purple veining.
Common on waste land mainly in the coastal districts ; world-wide in the tropics ; probably introduced and now naturalised. (See Appendix).

32. **C. arenaria** *Benth.*—F.T.A. 2 : 11 ; Bak. f. l.c. 258 ; Chev. Bot. 167. Stems woody, prostrate, much-branched, up to 1 ft. long, densely pale villous.
French Sudan : Timbuktu. Senegal : Lake Guier (Dec.) ! Richard Tol, etc., St. Louis ; Dakar. N. Nigeria : Katagum (July) ! Extends into Mauritania. Exsicc.—*Roger* 91. *Heudelot. Dalz.* 15. *Chev.* 1264. (See Appendix).

33. **C. glauca** *Willd.*—F.T.A. 2 : 12 ; Bak. f. l.c. 259 ; Chev. Bot. 168. Erect glabrous herb, 1–3 ft. high or taller in long grass ; flowers yellow, distant on lax axillary and terminal racemes.
Common in fields and amongst grass ! Widely spread in Africa. Exsicc.—*Heudelot* 199. *T. Vogel* (no number). *Sc. Elliot* 4257 ; 4730. *Dalz.* 86 ; 348 ; 590. *Lely* 561 ; 602. (See Appendix).

34. **C. spartea** *Planch.*—F.T.A. 2 : 12 ; Bak. f. l.c. 262. Like the last.
Sierra Leone ! Extends to Nyasaland and Angola. Exsicc.—*Afzelius.*

35. **C. Vogelii** *Benth.*—F.T.A. 2 : 14 ; Bak. f. l.c. 264. *C. Parsonsii* Bak. f. Like the last but yellowish-pilose, 2–3 ft. high or more when in tall grass ; flowers in elongated racemes.

Togo : Kete Kratschi. N. Nigeria : Lokoja (Sept., Oct.) ! Nupe ! Abinsi ! Alkalire (Sept.) ! Extends to E. Sudan and Congo. Exsicc.—*T. Vogel* 158. *Barter* 992 ; 1629. *Dalz.* 17 ; 590a. *Lely* 643. *Parsons* L 38.

36. **C. bongensis** *Bak. f.* l.c. 256. An erect branched pilose herb, slightly woody below, a few inches to about 1 ft. high ; flowers very small yellow, purple-veined.
N. Nigeria : Bauchi Plateau, Naraguta (Aug.) ! Vom, 3,000–4,500 ft. ! Extends to Cameroons, E. Sudan and Nyasaland. Exsicc.—*Lely* 504 ; 506. *Dent Young* 39.

Imperfectly known species.

C. Leprieurii *Guill. & Perr.*—F.T.A. 2 : 265 ; Bak. f. l.c. 265.
Senegal : Walo. Exsicc.—*Leprieur.*

C. uniflora *Bak.*—F.T.A. 2 : 13 ; Bak. f. l.c. 273.
Senegal. Exsicc.—*Perrottet.*

C. glaucoides *Bak. f.* l.c. 393.
Senegal : Cape Manuel. Exsicc.—*Talmy* 12.

35. LUPINUS Linn.—F.T.A. 2 : 44.

Annual ; stems silky-villous ; leaves digitately 5–7-foliolate ; leaflets sessile, oblanceolate, 2·5–3·5 cm. long, up to 1 cm. broad, silky-pilose below ; flowers in lax racemes ; calyx campanulate, nearly 1 cm. long, 2-lobed to nearly the middle, the upper lobe entire or emarginate, the lower slightly 3-toothed ; stamens united in a tube ; fruit compressed, dehiscent, silky-pilose, septate between the seeds .. .. *Termis*

L. Termis *Forsk.*—F.T.A. 2 : 44. Erect, 12–18 in. high ; flowers white with blue markings.
Senegal. Also in the Nile districts. Exsicc.—*Leprieur* and *Perrottet.*

36. ADENOCARPUS DC.—F.T.A. 2 : 47.

Branches rigid, densely silky-pilose ; leaves often fasciculate, digitately 3-foliolate ; leaflets oblong-lanceolate, acute, about 5–8 mm. long ; flowers in dense sessile terminal heads ; calyx pubescent, the upper two teeth lanceolate, acuminate, the lower 3-dentate ; corolla about twice as long as the calyx ; fruits about 2 ·2·5 cm. long, 5–6-seeded, viscous-glandular .. .. *Mannii*

A. Mannii *Hook. f.*—F.T.A. 2 : 47. A shrub up to 6 ft. or more high, with yellow flowers and shortly bristly fruits.
Cameroons Mt., abundant above the forest line up to 12,000 ft. ! Fernando Po, 9,000 ft. (Dec.) ! Also on the Bambuto Mts., Cameroons, and the mountains of Uganda and East Africa. Exsicc.—*Mann* 594 ; 1308 ; 2180. *Dalz.* 8316. *Dunlap* 209.

37. LOTUS Linn.—F.T.A. 2 : 61.

Style denticulate ; branches glabrous ; leaves petiolate ; leaflets 3, linear-oblanceolate, acute, 1–2 cm. long, appressed-pubescent ; stipules leafy ; flowers umbellate, about 1·3 cm. long ; fruits 2·5–3 cm. long, glabrous .. .. *Jacobaeus*

Style not denticulate :

Leaves petiolate ; stems subherbaceous ; leaflets obovate, up to 3·5 cm. long, shortly pubescent ; stipules similar to but smaller than the leaflets ; flowers umbellate, subtended by a leafy bract ; fruits 3·5 cm. long, glabrous .. .. *arabicus*

Leaves sessile ; stems appressed-pubescent ; leaflets obovate-oblanceolate, densely appressed-pilose, about 8 mm. long, the stipules similar in size and shape ; flowers umbellate, subtended by several bracts ; young fruits pubescent .. *Jolyi*

1. **Lotus Jacobaeus** *Linn.*—Bak. f. Legum. Trop. Afr. 1 : 86. Herbaceous, woody at the base, with purple flowers.
Gambia ! Also in Cape Verde Islands. Exsicc.—*Mungo Park.*

2. **L. arabicus** *Linn.*—F.T.A. 2 : 62 ; Bak. f. l.c. 90. A procumbent annual, woody at the base ; branches 1 ft. or more long ; flowers yellow.
Senegal : Lower Senegal River ! Extends to Egypt and Beluchistan, Mozambique and Angola.

3. **L. Jolyi** *Batt.* in Bull. Soc. Bot. Fr. 47 : 251 ; Chev. Bot. 171. Stems numerous, silvery hairy, up to 18 in. high, from a woody base ; flowers yellow, the standard brown-purple.
Mauritania : Rio de Oro ; Cape Blanco (Jan.). Also in Algeria. Exsicc.—*Chev. Herb.* 18902 ; 25572.

38. MELILOTUS Linn.—F.T.A. 2 : 52.

Stems slender, slightly pubescent ; leaves pinnately trifoliolate ; leaflets oblanceolate, subtruncate at the apex, dentate, 1–2 cm. long, glabrous ; racemes axillary, slender ; flowers very small, becoming reflexed ; fruit suborbicular, about 4–5 mm. diam., rugose .. .. *indica*

M. indica *All.* Fl. Pedem. 1 : 308 ; Chev. Bot. 171. *M. parviflora* Desf.—F.T.A. 2 : 52. An erect glabrous annual, 1–2 ft. high, with small yellow flowers.
French Sudan : Bilma ! A common weed from Canary Islands to India, Mauritius, S. Africa, etc. Exsicc. —*Ducellier* ex *Herb. Chev.* 28632.

39. TRIGONELLA Linn.—F.T.A. 2 : 49.

A more or less branched annual ; stems glabrous ; leaves pinnately trifoliolate ; leaflets oblanceolate to obovate, rounded and denticulate at the top, 1·5–3 cm. long, glabrous ; flowers solitary or paired, axillary, subsessile ; calyx with linear teeth ; fruits falcate, up to 15 cm. long, long-beaked and resembling that of a Crucifer, longitudinally nerved, glabrous .. .. *Foenum-graecum*

T. Foenum-graecum *Linn.*—F.T.A. 2 : 49 ; Chev. Bot. 171. Erect, 1–2 ft. high, with bright yellow flowers.
French Sudan : Timbuktu district (perhaps once cultivated). East to Arabia, etc., a weed of cultivation. Exsicc.—*Vuillet* ex *Herb. Chev.* 28644.

40. TRIFOLIUM Linn.—F.T.A. 2 : 53.

Leaflets obovate-elliptic, sharply serrulate, cuneate at the base, about 3 cm. long and 1·5 cm. broad, glabrous, strongly nerved ; stipules partly adnate to the petiole, about 1·5 cm. long, tailed-acuminate ; flower-heads pedunculate, ovoid-globose, about 1·5 cm. diam. ; peduncles glabrous or nearly so .. .. .. 1. *subrotundum*

Leaflets linear-oblanceolate, finely toothed, 1·5–3 cm. long, very closely nerved ; stipules adnate to the top of the petiole ; flower-heads about 1·5 cm. diam., on rather short hairy peduncles .. .. 2. *simense*

1. **T. subrotundum** *Steud.*—F.T.A. 2 : 59. *T. Goetzenii* Taub. Perennial with herbaceous stems, 1–2 ft. long, diffusely branched, glabrous, with reddish or violet flowers.
Cameroons Mt., 8,500 ft. (Nov.) ! Fernando Po, 9,000 ft. (Dec.) ! Also on the mountains of Abyssinia, East Africa and Angola. Exsicc.—*Mann* 603. *Migeod* 203. *Preuss* 972.

2. **T. simense** *Fresen.*—F.T.A. 2 : 57. Stem up to 18 in. long, slightly pubescent, with red-mauve or purplish-violet flowers.
S. Nigeria : Calabar ! Cameroons Mt., 7,000–9,000 ft. (Nov., Dec.) ! Fernando Po, 8,500 ft. (Dec.) ! Also on the mountains of Abyssinia, Somali and East Africa. Exsicc.—*Mann* 602 ; 2018. *Hewan. Migeod* 168.

41. MEDICAGO Linn.—F.T.A. 2 : 50.

Stems pilose ; leaves pinnately trifoliolate ; leaflets oblanceolate, with jagged teeth in the upper third, about 3 cm. long and 1 cm. broad, more or less pilose ; stipules foliaceous, lanceolate, acuminate, about 1·5 cm. long ; flowers crowded in short axillary racemes ; calyx 7 mm. long, teeth linear-subulate ; corolla a little longer than the calyx ; fruits spirally coiled, slightly pilose .. .. .. *sativa*

M. sativa *Linn.* Sp. Pl. 778 ; Holl. 2 : 186 ; Chev. Bot. 171. Erect, 1–2 ft. high, with pithy angled stems and bluish-purple flowers. Cultivated in most temperate and subtropical regions.
French Sudan : Bilma. (See Appendix).

42. CAJANUS DC.—F.T.A. 2 : 215.

A shrub with ribbed shortly silky-pubescent branches ; leaves trifoliolate ; leaflets lanceolate, acute, up to 10 cm. long and 3·5 cm. broad, minutely tomentellous and glaucous-grey below ; stipules lanceolate, acute ; flowers yellow in subcapitate axillary racemes 6–8 cm. long ; corolla 1·5–1·8 cm. long ; fruits obliquely subtorulose, beaked, 5–6 cm. long, 3–4-seeded, shortly tomentellous ; seeds shining 1. *Cajan*

As above in habit but leaflets obliquely elliptic or obovate, subacute, up to 3·5 cm. long and 1·5 cm. broad, silky-tomentellous below, stipules deciduous ; fruits oblong, 2–4-seeded, 3 cm. long, tomentose .. .. 2. *Kerstingii*

1. **C. Cajan** *Millsp.* in Field Columb. Mus. Bot. 2 : 53. *Cajanus indicus* Spreng.—F.T.A. 2 : 216 ; Stapf 595 ; Holl. 2 : 236 ; Chev. Bot. 204.
Native of East Indies and cultivated throughout the tropics. (See Appendix).

2. **C. Kerstingii** *Harms* in Fedde Repert. 14 : 196. A shrub 3–7 ft. high with stems less angular than the preceding species ; branchlets and underleaf shortly white-silky.
Togo : Sokode-Basari, in open savannah (fr. Sept.) ! Exsicc.—*Kersting* 570.

43. ATYLOSIA W. & A. Prod. 257 (1834).

A slender twiner ; stems softly pubescent ; leaves trifoliolate ; leaflets obovate, rounded at the apex, 2–3 cm. long, 1–2 cm. broad, softly tomentose on both surfaces ; flowers in axillary pairs, shortly pedicellate ; fruits 3–6-seeded, oblong, 2–2·5 cm. long, septate between the seeds, softly tomentellous, apiculate .. .. *scarabaeoides*

A. scarabaeoides *Benth.* in Miq. Pl. Jungh. 242.
Sierra Leone : near Franziga, Tambakka country, on alluvium ! Also in Shari region ; widely spread in tropical Asia and in the Mascarene Islands. Exsicc.—*Sc. Elliot* 5048.

44. RHYNCHOSIA Lour.—F.T.A. 2 : 216.

Calyx as long as or longer than the corolla, persistent and more or less as long as the fruit :

Lateral calyx-lobes very small, about ¼ as long as the others ; leaves, etc., more or less as in *R. cyanosperma* .. .. 1. *Preussii*

Lateral calyx-lobes nearly as long as the others :

Leaflets densely and softly tomentose below, obliquely ovate, acutely acuminate, 8–12 cm. long, up to 8 cm. broad ; stipels acicular, 6 mm. long ; racemes tomentose, up to 20 cm. long ; pedicels 1–1·5 cm. long ; calyx deeply divided, lobes oblong-lanceolate, 1–1·5 cm. long, villous ; fruits about 2 cm. long, silky ; seeds dark blue .. .. 2. *cyanosperma*

Leaflets glabrous or nearly so below :

Calyx-lobes obtuse at the apex ; other characters more or less as in preceding but inflorescence much shorter and denser .. .. 3. *calycina*

Calyx-lobes acute or acutely acuminate :
Calyx divided nearly to the base, lobes shortly puberulous, not glandular, 1·3–1·5 cm. long ; leaflets very broadly ovate, acutely acuminate, about 10 cm. long and 8 cm. broad, glabrous below ; stipels acicular, 8 mm. long ; racemes pedunculate, up to 25 cm. long ; fruits finely tomentellous, 2-seeded .. 4. *Mannii*
Calyx tubular at the base ; lobes glandular-pubescent outside, about 1 cm. long, acutely acuminate ; leaflets ovate-rhomboid, acuminate, about 6 cm. long and 4 cm. broad, shortly pubescent on the nerves below ; fruits enveloped by the resinous calyx, about 1 cm. long .. .. 5. *resinosa*
Calyx usually much shorter than the corolla (if nearly as long then lobes subulate-lanceolate) :
Calyx-lobes rounded or very obtuse at the apex, about 2 mm. long ; leaflets ovate, acute, 5–8 cm. long, up to 6 cm. broad, very shortly pubescent below ; racemes elongated, softly tomentellous ; fruits 2·5 cm. long, softly tomentellous 6. *Buettneri*
Calyx-lobes acute to acutely acuminate :
Leaflets rather long- and abruptly acuminate, broadly rhomboid, broadly cuneate at the base :
Flowers in slender pedunculate racemes ; stipules large and conspicuous, persistent, about 1 cm. long ; fruits reflexed, 3·5 cm. long, acuminate, loosely covered with long weak spreading hairs viscous at the base .. .. 7. *viscosa*
Flowers in dense short subsessile racemes ; stipules small ; fruits small, 1–1·5 cm. long, pilose with weak slender hairs, long-acuminate .. .. .. 8. *debilis*
Leaflets rounded or at most shortly acute at the apex :
Leaflets appressed-silky on both surfaces, and especially on the nerves, small, up to about 2 cm. long and broad ; flowers in short lax racemes about twice as long as the leaves ; fruits curved, 1·5–2 cm. long, softly pubescent .. 9. *Memnonia*
Leaflets at most slightly pubescent :
Hairs on the stems more or less glandular ; branches elongated ; leaflets broadly ovate, subacute, up to 3 cm. long and broad, pubescent mainly on the nerves ; flowers few in slender racemes a little longer than the leaves ; standard 1·3 cm. long, markedly striate ; fruits 3 cm. long, slightly pubescent 10. *nyasica*
Hairs on the stems not glandular :
Flowers about 1·5 cm. long ; standard pubescent outside ; leaflets more or less rhomboid-ovate, subacute, up to 5 cm. long and 4 cm. broad, slightly pubescent below ; fruits narrowed at the base, 3 cm. long, slightly pubescent, mucronate 11. *caribaea*
Flowers up to 1 cm. long ; further characters more or less as in preceding, but stems weaker and fruits about ½ as large .. .. .. 12. *minima*

1. **Rhynchosia Preussii** *Taub.* mss. *Cylista Preussii* Harms. A twiner with striate tomentellous branchlets and inflorescence, in habit resembling the next.
S. Nigeria : Barombi (May) ! Also in French Cameroons and Gabon. Exsicc.—*Preuss* 190.
2. **R. cyanosperma** *Benth.*—F.T.A. 2 : 218. *R. tomentosum* Baill., not of Hook. & Arn. An ornamental twiner with dense racemes of cream-coloured flowers varying from rich red or violet to white, and grey-velvety fruits.
Gold Coast : Aburi ! S. Nigeria : Lagos ! Fernando Po (June) ! Widely spread in tropical Africa, Mascarene Islands and East Indies. Exsicc.—*Barter* 1615. *Millen* 116. (See Appendix).
3. **R. calycina** *Guill. & Perr.*—F.T.A. 2 : 217 ; Stapf 596 ; Chev. Bot. 205. Like the last but with cream-coloured flowers turning rich red-brown when dry ; common and apparently confined to the area. Exsicc. —*Perrottet. Don. Ogilvie. T. Vogel* 66. *Barter* (no number). *Mann* 88 ; 730. *Ingram. Sc. Elliot* 4318. *Whyte. Brown* 312. *Farmar* 205. (See Appendix).
4. **R. Mannii** *Baker*—F.T.A. 2 : 217. A climber with red or white red-striped flowers.
S. Nigeria : Oban ! Fernando Po (Dec.) ! Extends to Uganda and Angola. Exsicc.—*Mann* 88. *Talb.* 1206.
5. **R. resinosa** *Hochst.*—F.T.A. 2 : 218. A climber with glandular grey-pubescent stems and yellow or reddish-tinged flowers.
French Guinea : Timbo and environs (Dec.) ! Also in E. Sudan, Abyssinia and extending south to Rhodesia. Exsicc.—*Chev.* 14631.
6. **R. Buettneri** *Harms* in Engl. Bot. Jahrb. 30 : 90. A twiner with pale rusty-pubescent stems and greenish-red or purplish flowers.
French Guinea : Kouroussa (Oct.) ! Togo : Bismarckburg (Oct.) ! S. Nigeria : Lagos ! Wumuye (fr. Jan.) ! Also in French Cameroons and Upper Ubangi. Exsicc.—*Macgregor* 137. *Thomas* 2162. *Poboguin* 444 ; 961.
7. **R. viscosa** *DC.*—F.T.A. 2 : 222. A twiner with glandular pubescent stems and purplish flowers.
N. Nigeria : Lokoja (Oct.) ! S. Nigeria : Lagos ! All over tropical Africa, in the Mascarene Islands and East Indies. Exsicc.—*Millen* 157. *Parsons* 97.
8. **R. debilis** *Hook. f.*—F.T.A. 2 : 222. A slender twiner or climber with grey-pubescent stems and yellow or reddish flowers.
Gold Coast : Kumasi ! Togo : Kpandu. S. Nigeria : Lagos ! Ogwashi (Dec.) ! Oban ! Cameroons Mt., 1,000 ft. (Dec.) ! Extends to Uganda and south to Angola. Exsicc.—*Mann* 1249. *Cummins* 240. *Millen* 90. *Thomas* 1825 ; 2056. *Talb.* 1311.
9. **R. Memnonia** *DC.*—F.T.A. 2 : 220 ; Chev. Bot. 206. Stems suberect, prostrate or twining, hoary-silky, with small yellow flowers in erect racemes.
French Sudan : Tile (Aug.) ! N. Nigeria : Katagum (July) ! Bornu, Kuka (Jan.) ! Extends to E. Sudan, East Africa and Angola. Exsicc.—*E. Vogel* 8. *Dalz.* 35.
10. **R. nyasica** *Bak.* in Kew Bull. 1897 : 263. *R. glutinosa* Harms – Chev. Bot. 206. *R. Kerstingii* Harms. Suberect, with lax slightly viscid-hairy branches and flowers yellow with purple streaks.
French Sudan : Balato ; Koundian. French Guinea : Beyla, between Manankoro and Boola. Sierra Leone : Falaba, 3,000–4,000 ft. (Mar.) ! Gold Coast : Salaga ! Togo ! N. Nigeria : Kontagora (Jan.) ! Bauchi Plateau, Vom, 3,000–4,500 ft. Through Cameroons to E. Sudan. Exsicc.—*Sc. Elliot* 5173. *Dalz.* 45. *Dent Young* 68. *Chev.* 20899. *Kersting* 482.

11. **R. caribaea** *DC.*—F.T.A. 2 : 220 ; Chev. Bot. 205. *R. macinaca* A. Chev. Bot. 206. Stems suberect from a woody rootstock or twining, grey-pubescent, with axillary racemes of yellow red-streaked flowers. Throughout the area and all over tropical Africa, the Cape, and tropical America. Exsicc.—*Heudelot* 401. *Afzelius*. *Barter* 1590. *Chev.* 24851. *Rowland*. *Dalz.* 44 ; 612. *Lely* 163. (See Appendix).

12. **R. minima** *DC.*—F.T.A. 2 : 219 ; Holl. 2 : 237 ; Chev. Bot. 206. Like the last but usually subglabrous, with smaller flowers in shorter racemes.
French Sudan : Koulikoro ; Guélia ; Bilma. Senegal ! Sierra Leone ! Gold Coast : Accra ! N. Nigeria : Lokoja ! Katagum (Sept) ! Bauchi Plateau Yom, 3,000-4,500 ft. Throughout tropical Africa, at the Cape and in N. America. Exsicc.—*Roger*. *Heudelot* 532. *Barter* (no number). *Brown* 335 ; 388. *Farmar* 475. *Dalz.* 38. *Lely* 688. *Dent Young* 69. (See Appendix).

45. ERIOSEMA E. Mey.—F.T.A. 2 : 223 ; Bak. f. in Journ. Bot. 33 : 97 (1895).

Leaves trifoliolate (or rarely 4-foliolate) :
Leaflets linear, very acute, up to 18 cm. long and 1·3 cm. broad, softly white-tomentose below and with scattered black glands ; petiole very short ; stipules lanceolate,

Fig. 148.—Eriosema cajanoides *Hook. f.* (Papilionaceae).
A, flowering shoot. B, flower. C, standard. D, wing. E, flower with corolla removed. F, G, anther front and back. H, pistil. I, fruits. J, fruit showing seeds.

acute, ribbed, about 1 cm. long ; racemes terminal, slender, with numerous reflexed flowers about 8 mm. long ; fruits broadly elliptic, 1 cm. long, densely long-pilose
1. *linifolium*

Leaflets lanceolate or oblong to ovate :
Leaves petiolate, petiole nearly as long as the lateral leaflets ; leaflets ovate or ovate-elliptic, mucronate, 3–5 cm. long, 1·5–2·5 cm. broad, slightly pubescent on the nerves below ; stipules subulate-lanceolate, up to 1 cm. long ; racemes few-flowered and long-pedunculate ; flowers about 8 mm. long ; fruits elliptic, 1·3–1·5 cm. long, long-pilose .. .. 2. *spicatum*
Leaves sessile or very shortly petiolate, petiole much shorter than the lateral leaflets :
Flowers in long spike-like racemes :
Leaflets completely covered or nearly completely covered below with a close white felt of hairs, strongly nerved, oblong-lanceolate, acute to emarginate, 4–10 cm. long, up to 3·5 cm. broad ; stipules deciduous, small and triangular ; flowers recurved, up to 1·5 cm. long ; fruits broadly elliptic, 1·5–2 cm. long, 2-seeded, densely pilose outside, glossy inside .. .. 3. *cajanoides*
Leaflets loosely pilose or pubescent below :
Leaflets ciliate or pubescent with long slender hairs :

Leaflets oblong, 2·5–6 cm. long, 1–2·5 cm. broad; stipules lanceolate, about 8 mm. long, long-ciliate; racemes about twice as long as the leaves, shortly pubescent; flowers about 1 cm. long; fruits broadly elliptic, about 1·5 cm. long, long-pilose .. .. 4. *bauchiense*

Leaflets elongate-lanceolate, 5–11 cm. long, up to 1·5 cm. broad, more or less densely pilose with long slender hairs; stipules lanceolate, about 1·5 cm. long, closely nerved; racemes pedunculate, usually as long as or longer than the leaves; fruits densely pilose .. .. 5. *shirense*

Leaflets pubescent with very short hairs on the margin; leaflets lanceolate, mucronate, 3·5–7 cm. long, 0·5–2 cm. broad; stipules subulate-lanceolate, strongly nerved, about 1 cm. long; fruits elliptic, 2 cm. long, loosely pilose 6. *sparsiflorum*

Flowers capitate or subcapitate :

Leaflets pubescent mainly on the nerves; bracts linear, shorter than the flowers; leaflets lanceolate, very acute or mucronate, up to 12 cm. long and 2 cm. broad; stipules lanceolate-acuminate, up to 1·5 cm. long; calyx-lobes filiform, long-pilose; valves of fruit curling up, glossy inside .. .. 7. *glomeratum*

Leaflets covered all over the lower surface with a soft white indumentum; bracts broadly lanceolate, longer than the flowers, with long slender tips; leaflets oblanceolate, rounded or broadly emarginate, 2·5–5 cm. long, 1–2·5 cm. broad, subulate on the upper surface; stipules lanceolate, strongly nerved; valves of fruits curling up, pilose outside, glossy inside .. .. .. 8. *griseum*

Leaves 1-foliolate :

Leaflet linear or linear-lanceolate, narrowed to the base, mucronate, 7–11 cm. long, 1–1·5 cm. broad, softly tomentose on both surfaces, whitish below, with ascending nerves; stipules lanceolate, acuminate, 1–1·3 cm. long, tomentellous; flowers few and reflexed on long peduncles, about 1·3 cm. long; calyx-lobes linear-lanceolate; fruits oblong-elliptic, about 1 cm. long, densely long-pilose .. 9. *monticola*

Leaflet broadly rounded or cordate at the base :

Leaflet densely silky below :

Leaflet ovate or broadly elliptic, mucronate, rounded or subcordate at the base, 7–16 cm. long, 3–8 cm. broad, with about 10 pairs of lateral nerves; stipules very large, up to 3 cm. long, appressed-pilose; flowers in a short dense cylindrical raceme; fruits very densely villous .. .. 10. *pulcherrimum*

Leaflet lanceolate, acute, sessile and rather broad at the base, 11–16 cm. long, 2–3 cm. broad, glabrous above except the midrib, softly whitish-tomentose below, obscurely nerved; stipules lanceolate, 1·5–2 cm. long, villous; racemes dense, cylindric, about 7 cm. in flower, up to 15 cm. in fruit; flowers small, reflexed; fruits crowded, about 1 cm. long, densely silky-villous and glandular 11. *Afzelii*

Leaflet loosely pubescent and more or less strongly reticulate below :

Leaflet broadly rounded at the base, ovate, mucronate, 8–15 cm. long, 6–8 cm. broad; stipules linear, persistent, about 1 cm. long; flowers in short cylindrical racemes; bracts and bracteoles linear; pedicels 2-flowered; fruits oblong, 1·5–2 cm. long, rigidly pilose outside, satiny inside .. .. .. 12. *holophyllum*

Leaflet deeply cordate at the base, lanceolate, obtusely mucronate, 4–9 cm. long, 1–2·5 cm. broad; stipules subulate from a broader base, about 0·5 cm. long; flowers few in a shortly stalked raceme; fruits curled and long-pilose, about 1 cm. long .. .. 13. *cordifolium*

Leaflet shortly cordate at the base, ovate-orbicular, mucronate, 1–2·5 cm. long, thinly pubescent on the nerves below; flowers in a terminal spike-like raceme, with leafy bracts; calyx-lobes pilose .. .. 14. *Chevalieri*

1. **Eriosema linifolium** *Bak. f.* in Journ. Bot. 33 : 228; Chev. Bot. 208. Erect, 1–3 ft. high, from a woody more or less tuberous base; flowers greenish-yellow in a raceme 2–6 in. long.
French Sudan: Gourma, at Koukobiri (July)! Ivory Coast: Mankono, between Séguéla and Siana. N. Nigeria: Abinsi (Nov.)! Also in E. Sudan. Exsicc.—*Dalz.* 608. *Chev.* 24310.

2. **E. spicatum** *Hook. f.*—F.T.A. 2 : 226 (as *E. parviflorum* E. Mey.). *E. parviflorum* Bak. F.T.A. 2 : 225, not of E. Mey.; Staph 596. *E. djalonensis* A. Chev. *E. caillei* A. Chev. Half shrubby, softly tawny-hairy, erect from a woody base or half straggling; flowers reddish-yellow.
French Guinea: Futa Jallon, Timbo region, etc.! Farana, Guerzé country, Mt. Nzo (2,500 ft.), Kaoulen-dougou, near Nzo (Mar.)! Mamou (Mar.)! Sierra Leone: Freetown! Luseniya (Dec.)! Liberia: Monrovia (Nov.)! Grand Bassa! S. Nigeria: Eket! Also in Cameroons and Gabon. Exsicc.—*Heudelot* 759. *T. Vogel* 1. *Ansell. Barter* (no number). *Sc. Elliot* 4123. *Farmar* 248. *Dalz.* 8393. *Chev.* 12426; 12601; 12624; 14737; 21013; 21071; 20546; 20631. *Linder* 1520.

3. **E. cajanoides** *Hook. f.*—F.T.A. 2 : 227; Chev. Bot. 207. *E. argenteum* A. Chev. *E. sericeum* A. Chev. Bot. 209 (partly), not of Bak. Erect undershrub, grey-silky, more or less branched, 4–5 ft. high or more in tall grass; flowers golden-yellow, odorous.
Common in grass and bush savannah, extending to S. Africa. Exsicc.—*Heudelot* 851. *Barter* 1119; 1195. *Irving. Rowland. Sc. Elliot* 5099. *Millen* 64. *Farmar* 271. *Elliott* 213; 245. *Talb.* 513; 1402. *Poéguin* 700. *Caille* ex *Herb. Chev.* 14632; 21722; 22009; 23535; 23993. (See Appendix).

4. **E. bauchiense** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, incd. Habit of *E. spicatum*, 6–12 in. high, from a woody base.
N. Nigeria: Bauchi Plateau, Vom, 3,000–4,500 ft.! Exsicc.—*Dent Young* 78; 81.

5. **E. shirense** *Bak. f.* in Trans. Linn. Soc. Ser. 2, 4 : 11, with figure. Erect, 9–12 in. from a woody base, pale or rufous pilose.

French Guinea: between Kaba and Mamou (May)! Ivory Coast: Mankono (June)! N. Nigeria: Bauchi Plateau, Jos (Mar.)! Also in Nyasaland and Rhodesia. Exsicc.—*Hill* 7. *Chev.* 13261; 21843.

6. **E. sparsiflorum** *Bak. f.* in Journ. Bot. 33: 144; Chev. Bot. 209. Erect, pubescent, 1–1½ ft. high, woody below from a woody rootstock; flowers orange-yellow, in lax axillary racemes 3–6 in. long.
N. Nigeria: Bauchi Plateau, Naraguta, 4,000 ft. (June)! Vom, 3,000–4,500 ft.! Also in E. Sudan. Exsicc.—*Lely* 19; 336. *Dent Young* 82.

7. **E. glomeratum** *Hook. f.*—F.T.A. 2: 228; Chev. Bot. 208. *E. sericeum* Bak.—F.T.A. 2: 226. An erect, low-branching, softly hairy shrub, with yellow flowers in dense axillary subsessile clusters.
Throughout the area and extending E. Sudan, E. Africa and Angola. Exsicc.—*Heudelot* 27; 682; 752; 758. *T. Vogel* 32; 60. *Barter* 190; 364; 1605; 2230. *Sc. Elliot* 3948. *Whyte. Pobéguin* 467; 697. *Warnecke* 224. (See Appendix).

8. **E. griseum** *Bak.*—F.T.A. 2: 228. *E. sericeum* A. Chev. Bot. 209, partly, not of Baker. *E. togoense* Taub. A low-branched undershrub, sometimes less than 1 ft. high, closely grey-pubescent, from a thick woody root; flowers yellow, concealed by bracts in shortly pedunculate heads.
Ivory Coast: Mankono (June)! Baoulé Nord, Mt. Kangoroma (July)! Togo: Fasugu, near Bismarckburg! N. Nigeria: Sokoto! Zaria (Feb., Mar.)! Kontagora (Jan.)! Katagum! Naraguta (May)! S. Nigeria: Abo! Yoruba country, on hills! Also in E. Sudan and Angola. Exsicc.—*Barter* 380; 1225. *Rowland.* *Dalz.* 49; 408. *Lely* 8. *Chev.* 21940; 22171. *Buettner* 658. (See Appendix).

9. **E. monticola** *Taub.* in Engl. Bot. Jahrb. 23: 196. Stems short from a woody rhizome; leaves white below; flowers reflexed.
Togo: Misahöhe; Agome Mts., 2,200 ft. (Mar.)! N. Nigeria: Bauchi Plateau, Vom! Exsicc.—*Baumann* 10. *Dent Young* 83.

10. **E. pulcherrimum** *Bak. f.* in Journ. Bot. 33: 99. *E. subacaule* A. Chev. Bot. 209. Erect, herb softly white-tomentose, a few inches high up to 1 ft. from a woody rootstock, the leaves folding up over the short raceme of yellow flowers.
French Guinea: Futa Jallon, between Timbo and Ditinn (Sept.)! Gold Coast: Ashanti, near Drobo (Apr.)! Dahomey: Atacora Mts. (June)! N. Nigeria: Zungeru (July)! Sokoto (June)! Bauchi Plateau, Vom, 3,000–4,500 ft.! S. Nigeria: Lagos Colony! Udi (May)! Ezagu (Mar.)! Extends to E. Sudan. Exsicc.—*Dalz.* 22; 533. *Thompson* 73. *Dent Young* 84. *Phillips* 60. *Chev.* 18401; 18452; 23942. (See Appendix).

11. **E. Afzelii** *Bak.*—F.T.A. 2: 225. A stiff erect herb, 2–3 ft. high, clothed with silky hairs; flowers reddish, in spike-like racemes.
Sierra Leone! Exsicc.—*Afzelius.*

12. **E. holophyllum** *Bak. f.* l.c. 99. *E. atacorense* A. Chev. Bot. 207. *Glycine holophylla* Taub. Erect, half woody, branched, 18 in. high, pubescent; flowers whitish, small, in subglobose or spike-like axillary and terminal racemes.
Dahomey: Atacora Mts. (June)! N. Nigeria: Bauchi Plateau, Naraguta, 4,000 ft. (May)! Also in E. Sudan. Exsicc.—*Lely* 240. *Chev.* 23952; 24114.

13. **E. cordifolium** *Hochst.*—F.T.A. 2: 224. Stem pubescent, herbaceous and flexuous, from a rootstock which may become fusiform or turnip-like; flowers yellow, in head-like racemes.
N. Nigeria: Bauchi Plateau, Naraguta, amongst grass (fr. Aug.)! Vom, 3,000–4,500 ft.! Also in Abyssinia. Exsicc.—*Lely* 482. *Dent Young* 80.

14. **E. Chevalieri** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Rhynchosia Chevalieri* Harms; Chev. Bot. 206. Stems short and erect from a woody rhizome; leaves gradually reduced into bracts.
French Sudan: Koundiam (Feb.)! Exsicc.—*Chev.* 422.

46. FLEMINGIA Roxb.—F.T.A. 2: 230.

Erect shrub; leaves unifoliolate; leaflet ovate to suborbicular, subacute, 3–8 cm. long, 2·5–5·5 cm. broad, pubescent on both sides; stipules subulate-lanceolate; flowers about 1 cm. long, solitary or paired on short pedicels; calyx-lobes linear, acute; corolla a little longer than the calyx; fruits oblong, 1·8 cm. long, slightly pubescent. *faginea*

F. faginea *Baker*—F.T.A. 2: 230; Chev. Bot. 209, incl. var. *glabra* A. Chev. *Rhynchosia faginea* Guill. & Perr. Tent. Fl. Seneg. 212, t. 52. A shrubby plant up to about 10 ft. high, with chestnut-brown branchlets, grey or rufous-tomentose, foliage somewhat like that of the beech, and purplish or white flowers.
French Sudan: Bamako (Jan.)! Senegal: Casamance! French Guinea: Futa Jallon, Diaguissa. Ivory Coast: Lower Comoé (Mar.). Exsicc.—*Leprieur* 366. *Chev.* 241.

47. PHYSOSTIGMA Balfour—F.T.A. 2: 191.

Climber; branches glabrous; leaves trifoliolate, the central one broadly ovate, the lateral obliquely ovate, rounded at the base, abruptly acuminate, up to 16 cm. long and 10 cm. broad, prominently 3-nerved at the base, glabrous; stipels semilunar; racemes axillary, drooping, the axis stout and zigzag with swollen nodes; pedicels curved, up to 5 mm. long; calyx broadly cupular, shortly lobed; standard enclosing the wings and keel, much curved round towards the calyx; fruit straight, narrowed at both ends, up to 15 cm. long and 4 cm. broad, glabrous; seeds few, 3 cm. long, ellipsoid, with one side nearly straight, the other side grooved by the depressed hilum .. .. *venenosum*

P. venenosum *Balfour*—F.T.A. 2: 191; Holl. 2: 223; Chev. Bot. 197; Engl. Pflanzenw. Afr. 3, 1: 698, fig. 316. Shrubby at the base, with lofty-twining branches; flowers curved like a shell, pink or purple. The Calabar Bean.
Liberia: Mount Barclay (June)! Ivory Coast: Upper Sassandra, Dyola country, between Man and Zagoué (May)! Gold Coast: Eastern Prov., Wankye (Aug.)! S. Nigeria: Calabar! Oban! Victoria (fr. Mar.)! Fernando Po! Also in French Cameroons. Exsicc.—*Thomson. Hutchinson. Chipp* 561. *Bunting* 8. *Kalbreyer* 90. (See Appendix).

48. PHASEOLUS Linn.—F.T.A. 2: 191.

Pods with 10 or more seeds, linear, 10–14 cm. long, 1–1·4 cm. broad, nearly flat, with thicker margins; flowers in rather stout racemes, glabrous, about 2·5 cm. long; leaflets broadly ovate, subacute, 7–12 cm. long, 4–8 cm. broad, glabrous below except on the nerves; stipels rather large, elliptic .. .. 1. *adenanthus*

Pods 2–4-seeded, obliquely oblanceolate, 6–8 cm. long, 1·5–2 cm. broad, the margins not thickened ; flowers in very slender racemes, about 1 cm. long, softly pubescent ; leaflets ovate-triangular, slightly and obtusely acuminate, 6–12 cm. long, 5–8 cm. broad, glabrous below or nearly so ; stipels small and inconspicuous 2. *lunatus*

1. **P. adenanthus** *F. G. Mey.*—F.T.A. 2 : 192 ; Stapf 595 ; Holl. 2 : 225 ; Chev. Bot. 197. A wide-climbing nearly glabrous perennial with fairly large pink and white flowers turning yellow.
Senegal : Casamance. Gambia : Kudang (Jan.) ! Liberia : Monrovia ! N. Nigeria : Nupe ! Katagum (Nov.) ! S. Nigeria : Brass ! Bonny (Oct.) ! Victoria ! Cosmopolitan in the tropics. Exsicc.—*Barter* 923 ; 1847. *Mann* 511. *Whyte. Dalz.* 42 ; 8017 ; 8019. *Preuss* 1127. (See Appendix).
2. **P. lunatus** *Linn.*—F.T.A. 2 : 192 ; Holl. 2 : 225 ; Chev. Bot. 197. A rank-growing twiner, biennial, with half-woody stems and rather small greenish-white or bluish flowers.
Cultivated throughout the tropics and perhaps naturalised in places. (See Appendix).

49. CLITORIA Linn.—F.T.A. 2 : 176.

Leaves pinnate ; leaflets 5–7, elliptic, rounded or emarginate at the apex, 3–4·5 cm. long, 1·5–3 cm. broad, shortly pubescent below ; flowers solitary, very shortly pedicellate, 4–5 cm. long ; bracteoles rounded, nervose, about ½ as long as the calyx ; calyx about 1·5 cm. long, lobes nervose, acute ; fruits flat, linear, beaked, about 10 cm. long and 1 cm. broad, sparingly pubescent .. .. .. 1. *Ternatea*

Leaves trifoliolate ; leaflets elliptic or ovate-elliptic, rounded or emarginate at the apex, 4–7 cm. long, 1·5–3·5 cm. broad, more or less pubescent below ; flowers 2–3 on axillary peduncles ; bracteoles ovate, pointed ; fruits about 4 cm. long, with a rib up the middle of the valves .. .. 2. *rubiginosa*

1. **C. Ternatea** *Linn.*—F.T.A. 2 : 177 ; Holl. 2 : 210 ; Chev. Bot. 194. A climber, somewhat shrubby below with deep blue flowers, occasionally pure white.
A cosmopolitan plant, often grown for ornament. Exsicc.—*Heudelot* 437. *Barter* 3394.
2. **C. rubiginosa** *Juss.* ex *Pers.* Syn. 2 : 303. *C. glycinoides* DC. A more or less pubescent twiner, with fragrant flowers about 2 in. long, white streaked with mauve or red.
S. Nigeria : Lagos ! Olokemeji ! Oban ! Eket ! A native of tropical America, probably introduced. Exsicc.—*Millen* 129. *Foster* 16 ; 319. *Thompson* 515. *Talb.* 1305 ; 3350.

50. SHUTERIA Wight & Arn.—F.T.A. 2 : 177.

Climber ; branchlets slender, hirsute with reflexed hairs ; leaves trifoliolate ; leaflets ovate, with long mucronate tip, about 5 cm. long and 3 cm. broad, softly pubescent on both surfaces ; lateral nerves about 7 pairs ; stipules lanceolate, about 1 cm. long, closely striate and pubescent ; stipels filiform ; racemes axillary, about as long as the leaves ; calyx-lobes with filiform tips ; fruit flat, linear-oblong, about 3·5 cm. long, ciliate on each margin .. .. *africana*

S. africana *Hook. f.*—F.T.A. 2 : 177. A herbaceous climber, the fruits often marked with a dark longitudinal band.
Cameroons Mt., 7,000 ft. (Nov.) ! Also in East Africa from Abyssinia to Nyasaland. Exsicc.—*Mann* 1974.

51. MUCUNA Adans.—F.T.A. 2 : 184.

Flowers arranged in elongated often zigzag or short racemes :

Leaves glabrous or sparsely pilose below ; leaflets obliquely ovate, rounded at the base, abruptly acuminate and mucronate at the apex, up to 15 cm. long and 8 cm. broad, 3-nerved at the base, finely reticulate on both surfaces ; peduncle very long and whip-like ; rhachis of inflorescence very zigzag ; bracts ovate, acuminate, about 2·5 cm. long ; calyx subtruncate ; standard very broad, about 4 cm. long ; fruits oblong or obovate, up to 20 cm. long and 6 cm. broad, transversely or obliquely lamellate, covered with stinging hairs ; seeds suborbicular, 3·5 cm. diam., with a long hilum around about ⅔ of the circumference .. .. .. 1. *flagellipes*

Leaves appressed-pilose below ; leaflets very obliquely ovate, unequal-sided and rounded at the base, acutely mucronate, up to 20 cm. long and 14 cm. broad ; peduncle up to 30 cm. long, rigid ; rhachis not zigzag ; bracts deciduous ; calyx rather deeply lobed ; standard rather short ; fruits very setose, curved, about 9 cm. long, faintly longitudinally ribbed ; seeds small, broadly elliptic, with a short hilum on one side .. .. 2. *pruriens*

Flowers more or less umbellate ; leaves silky-pubescent below ; leaflets obliquely ovate, shortly acuminate, up to 15 cm. long and 14 cm. broad ; peduncle short ; calyx lobed to about ⅓, lobes lanceolate ; fruits oblong, up to 15 cm. long, rather obliquely transversely lamellate and hispid with stinging hairs ; seeds suborbicular, about 2·5 cm. diam., hilum as in *M. flagellipes* .. .. 3. *urens*

1. **M. flagellipes** *Vogel*—F.T.A. 2 : 185 ; Chev. Bot. 196. A more or less glabrous lofty climber, with creamy white or yellowish flowers, subtended by grey-silky bracts, turning black in drying.
Liberia : Gbanga (Sept.) ! Ivory Coast : several localities. S. Nigeria : Nun R. ! Koboro, Lagos Colony ! Ijebu Ode (Aug.) ! Benin ! Onitsha (Oct.) ! Fernando Po (June, Dec.) ! Also in Cameroons. Exsicc.—*T. Vogel* 1. *Barter* (no number). *Mann* 21. *Millen* 154. *Linder* 505. (See Appendix).
2. **M. pruriens** *DC.*—F.T.A. 2 : 187 ; Holl. 2 : 220 ; Chev. Bot. 196. *M. Poggei* Taub. A lofty climber, with more or less pubescent stems ; flowers deep purple to almost black, 1½ in. long ; fruits densely clothed with rusty stinging hairs.
Cosmopolitan in the tropics. Exsicc.—*Barter* 333 ; 1155. *Millen* 124. *Sc. Elliot* 4369. *Talb.* 1316. *Mildbraed* 7378. *Linder* 858. (See Appendix).

3. **M. urens** *DC.*—F.T.A. 2 : 185 ; Holl. 2 : 221 ; Chev. Bot. 196. A climber ; stem with appressed whitish hairs ; flowers creamy or yellowish, of waxy consistence, 2 in. long or more, the standard broad, about ½ the length of the wings and keel.
Cosmopolitan in the tropics. Exsicc.—*T. Vogel* 199. *Barter* 1610 ; 1875. *Mann* 42. *Sc. Elliot* 4325. *Talb.* 1266. *Mildbraed* 7327. *Linder* 470. (See Appendix).

52. ERYTHRINA Linn.—F.T.A. 2 : 181.

Calyx entire or at most shortly and irregularly lobed at the apex :
Leaflets lanceolate to broadly ovate, rounded to shortly acuminate at the apex, at most rounded at the base, up to 15 cm. long and 12 cm. broad, glabrous or nearly so, sometimes with a few prickles on the midrib ; branches often prickly ; racemes lax ; pedicels 5–7 mm. long ; calyx 1·5 cm. long, nearly glabrous ; fruits moniliform, stipitate, becoming twisted, about 12 cm. long, closely puberulous ; seeds bright red, smooth and shining .. .. 1. *senegalensis*
Leaflets broadly ovate-orbicular, cordate at the base, tomentose below, the terminal one about 1·5 cm. broad ; the petiole unarmed or nearly so ; calyx about 12 mm. long, woolly .. .. 2. *sigmoidea*
Calyx irregularly and deeply lobed or deeply bifurcate at the apex :
Calyx glabrous outside ; leaflets (of young shoot) prickly on the nerves and rhachis, the lateral obliquely ovate, the terminal broadly elliptic, up to 23 cm. long and 16 cm. broad ; racemes many-flowered, stiff ; flowers in twos and threes ; calyx linear-lanceolate, about 4 cm. long, bifurcate at the apex .. .. 3. *excelsa*
Calyx softly tomentellous outside :
Calyx more or less regularly 5-lobed, ½ as long as the corolla, lobes linear-terete, 1–1·5 cm. long ; leaflets rhomboid-ovate, about 1·7 cm. long and broad, softly pubescent below ; fruits very moniliform, the segments eventually hanging together by strands, about 3 cm. diam. ; seeds keeled, scarlet, nearly 1·5 cm. long 4. *Addisoniae*
Calyx irregularly jagged-lobate at the apex, the limb contracted at the base :
Limb of calyx 3–4 cm. long, broad ; leaflets as in *E. senegalensis* but apparently not prickly ; fruits moniliform, 5–15 cm. long, twisted or curved, grey-puberulous ; seeds oblong, shining red .. .. 5. *altissima*
Limb 5–7 cm. long, split into narrow segments, segments toothed ; racemes very slender, softly tomentose .. .. 6. *Klainei*

1. **Erythrina senegalensis** *DC.*—F.T.A. 2 : 181 ; Holl. 2 : 215 ; Chev. Bot. 195. Commonly a small tree 10–15 ft. but attaining a height of 40–50 ft., armed with stout, slightly recurved prickles from a woody base ; conspicuous with scarlet flowers when leafless ; standard petal folded flat.
Throughout the area in savannah and coastal districts, and often planted. Also in Cape Verde Islands. Exsicc.—*Döllinger. T. Vogel* 105. *Barter* 836. *Sc. Elliot* 4516. *Moloney. Thomson. Millen* 49 ; 77. *Warnecke* 21. *Mildbraed* 7239. (See Appendix).
2. **E. sigmoidea** *Hua* in Bull. Mus. Hist. Nat. Paris, 3 : 327. A small tree, ? unarmed, tomentose on branchlets, leaves and inflorescence ; flowers rather small, red, in racemes about as long as the leaves, the standard nearly 1 in. long, narrow and curved like an S.
French Guinea : Futa Jallon, Timbo (May) ! Exsicc.—*Maclaud & Miquel* 49.
3. **E. excelsa** *Baker*—F.T.A. 2 : 183. A tall tree, with bole sometimes 60 ft., pale bark armed with strong spines ; flowers dull yellow, covering the tree when leafless.
Cameroons Mt. : Ambas Bay (Jan.), Buea (Feb.) ! Also in Unyoro, Uganda. Exsicc.—*Mann* 704. *Dalz.* 8181. (See Appendix).
4. **E. Addisoniae** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A tree about 40 ft. high, armed with spines on trunk and branches ; flowers red, 3–7 at the end of the rhachis.
Sierra Leone : Karene ! Also in Wando chiefdom and Kamboma, Central Province. Exsicc.—*Mrs. Addison.*
5. **E. altissima** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8d : 161 ; Chev. Bot. 195. A tall tree over 100 ft. high, buttressed at the base, with spines on the trunk and branches but not on the leaves ; flowers pink, usually in threes, in copious softly tomentellous panicles, appearing when the tree is leafless.
French Guinea : in the region of the Niger sources, Souradou (Jan.) ! Sierra Leone : Pendembu (Jan.) ! Ivory Coast : Upper Cavally, Nzo, in the forest (fr. Mar.). Upper Sassandra, Dyola country, near Man (May). Gold Coast : Aburi (Feb.) ! Anamabu (Jan.) ! Tano-Offeri (Jan.) ! Exsicc.—*Chev.* 20584. *Unwin & Smythe* 63. *Johnson* 880. *Lane-Poole* 323. *Vigne* 944 ; 1014. (See Appendix).
6. **E. Klainei** *Pierre ex Harms* in Engl. Bot. Jahrb. 49 : 443. A tree 50–70 ft. high, with spiny trunk ; branchlets puberulous or glabrous beset with small black conical spines ; flowers red, standard 2 cm. long, curved.
S. Nigeria : Oban ! Also in Gabon. Exsicc.—*Talb.* 114.

53. GALACTIA P. Br.—F.T.A. 2 : 188.

Twiner ; branches elongated, softly pubescent ; leaves trifoliolate ; leaflets oblong-elliptic, rounded at both ends, mucronate at the apex, 2–3·5 cm. long, 1–1·5 cm. broad, thinly pubescent beneath ; stipules subulate-lanceolate ; racemes axillary, few-flowered, up to 10 cm. long ; calyx divided to the middle, the lowermost lobe the longest ; fruits broadly linear, 4–5 cm. long, with a curved beak at the tip, shortly pubescent .. .. *tenuiflora*

G. tenuiflora *Wight & Arn.*—F.T.A. 2 : 188. Twining or trailing ; flowers whitish, fading to yellow.
N. Nigeria : Abinsi (June) ! Also in East Tropical Africa, Mascarene Islands and India. Exsicc.—*Dalz.* 587.

54. GLYCINE Linn.—F.T.A. 2 : 178.

Stems shortly pubescent with spreading hairs ; leaves trifoliolate ; leaflets narrowly elliptic, rounded at each end, mucronate, 3–5 cm. long, 1·5–2·5 cm. broad, pubescent

below ; stipules subulate ; flowers on very short leafy axillary branchlets ; calyx pilose ; fruit broadly linear, slightly curved, flat, about 4 cm. long and 0·8 cm. broad, thinly appressed-pubescent .. .. 1. *hedysaroides*

Stems appressed-pubescent with reflexed hairs ; leaves trifoliolate ; leaflets lanceolate, subacute, 5–6·5 cm. long, 1·5–2·5 cm. broad, densely appressed-silky below ; stipules very small ; flowers in slender axillary racemes, up to 15 cm. long ; flowers often paired, subsessile, about 5 mm. long ; calyx long-pilose .. .. 2. *andongensis*

1. **G. hedysaroides** *Willd.*—F.T.A. 2 : 179 ; Chev. Bot. 194. Stems woody at the base, wide-climbing above ; flowers white or pinkish.
Ivory Coast : between Bingerville and Potou Lagoon (Feb.) ! Gold Coast : Accra (June) ! Winnebah Plain (Feb.) ! Togo : Lome ! Dahomey : Mts. Atacora (June). Extends to Angola and East Africa. Exsicc.—*T. Vogel* (no number). *Don. Brown* 369. *Dalz.* 80 ; 85. *Warnecke* 238.
2. **G. andongensis** *Welw.*—F.T.A. 2 : 179. *Glycine Buettneri* Harms. Twining amongst bush grass or on shrubs ; flowers small, whitish.
Togo : Bismarckburg (Aug.) ! N. Nigeria : Abinsi (Nov.) ! Also in Angola and Uganda. Exsicc.—*Buettner* 163. *Dalz.* 589.

55. SPHENOSTYLIS E. Meyer Comm. 148 ; Harms in Engl. Bot. Jahrb. 26 : 308.

Leaves glabrous below :

Erect ; leaflets lanceolate or linear-lanceolate, rounded and mucronate at the apex, up to 14 cm. long and 3 cm. broad, with a conspicuous cartilaginous margin ; flowers several on axillary peduncles ; calyx broadly cupular, shortly and broadly lobed, about 5 mm. long ; corolla 1·5 cm. long ; fruits linear, 10–11 cm. long, slightly pubescent .. .. 1. *Schweinfurthii*

Climber ; leaflets ovate, acuminate, up to 14 cm. long and 6 cm. broad ; flowers few on stout axillary peduncles ; calyx 7 mm. long, undulately lobed ; corolla 2·5 cm. long ; fruits linear, up to 30 cm. long, glabrous ; seeds ellipsoid, smooth, about 1 cm. long, pale-coloured or marbled .. .. 2. *stenocarpa*

Leaves pubescent or tomentose below ; leaflets lanceolate to obliquely elliptic, entire or more or less 3-lobed, up to 8 cm. long and 6 cm. broad ; flowers solitary on each peduncle, with a large gland near the apex ; bracteole rounded, about 1 cm. long, tomentose ; calyx 5-lobed, 1·5 cm. long ; corolla 3·5 cm. long ; fruits nearly 15 cm. long, tomentose, the valves becoming spirally twisted ; seeds with a large caruncle 3. *holosericea*

1. **Sphenostylis Schweinfurthii** *Harms* in Engl. Bot. Jahrb. 26 : 309 ; Chev. Bot. 198. An erect undershrub, 3–5 ft. high, with fairly large yellow flowers.
French Sudan : Coumana (Feb.) ! Koba (Mar.) ! Togo : Sokode-Basari ! Dahomey : Atacora Mts., 2,500 ft. N. Nigeria : Kontagora (Feb.) ! Zaria Prov. (Feb.) ! Bauchi Plateau, 3,000–4,600 ft. ! Extends to E. Sudan and Abyssinia. Exsicc.—*Dalz.* 15 ; 402. *Hill* 26. *Dent Young* 76. (See Appendix).
2. **S. stenocarpa** *Harms* l.c. ; Chev. Bot. 198–9 ; Engl. Pflanzenw. Afr. 3, 1 : 693, fig. 315. *Dolichos stenocarpus* Hochst.—F.T.A. 2 : 213. *Vigna ornata* Welw. *Sphenostylis ornata* A. Chev. Bot. 198. A strong climber with conspicuous mauve-pink or purple flowers and a tuberous root ; wild and often cultivated.
French Sudan : Mossi ! Ouagadougou ! French Guinea : Futa Jallon, Timbo to Ditinn (Sept.) ! Ivory Coast : Bouroukrou ! Togo : Sokode-Basari ! N. Nigeria : Agaie (Oct., Nov.) ! Katagum ! Abinsi ! Zaria (Sept.) ! Kano ! S. Nigeria : Onitsha ! Aguku ! Extends to E. Sudan, Abyssinia, Congo, Angola and E. Africa. Exsicc.—*Barter* 1804. *Dalz.* 41 ; 626. *Yates* 51. *Lamb* 57. *Kersting* A. 680. *Chev.* 18518. (See Appendix).
3. **S. holosericea** *Harms* in Engl. Bot. Jahrb. 33 : 177. *S. Kerstingii* Harms. *Vigna holosericea* Welw.—F.T.A. 2 : 200 ; Chev. Bot. 200. *Vigna hastifolia* Baker—F.T.A. 2 : 200. A twiner, covered more or less with a dense white or yellowish pubescence ; flowers mauve, ornamental, fragrant, turning yellow ; root tuberous ; common amongst long grass.
Ivory Coast : between Comoé R. and Yabarasso (Dec.) ! Toumodi (Aug.) ! Togo : Sokode-Basari, Kuma Farm ! N. Nigeria : Lokoja (Sept., Oct.) ! Jebba ! Gombe (Oct.) ! S. Nigeria : Abeokuta ! Lagos Colony ! Also in Angola. Exsicc.—*Barter* 937. *Irving* 88. *Rowland. Dalz.* 26. *Chev.* 22405 ; 22557. *Kersting* 518.

56. VIGNA Savi—F.T.A. 2 : 194.

Calyx-lobes as long as or longer than the calyx-tube, subulate from a lanceolate base ; leaflets (except in *V. Thonningii*) linear to lanceolate

Leaflets linear to lanceolate, acute :

Leaflets with 3 longitudinally parallel nerves, all sessile on the petiole, narrowly linear-lanceolate, acute, 12–20 cm. long, 0·5–1 cm. broad, slightly pubescent on the nerves ; stipules ovate-lanceolate, about 7 mm. long, strongly nerved ; flowers paired on long peduncles ; calyx hirsute and ribbed .. .. 1. *longissima*

Leaflets with pinnate nervation, the terminal one stalked :

Stipules truncate at the base (not auriculate) ; leaflets linear, acute, rounded and unequal-sided at the base, up to 8 cm. long and 0·5 cm. broad, strongly reticulate ; lateral nerves few and oblique ; flowers subsolitary ; fruits 7 cm. long, setulose 2. *angustifolia*

Stipules auriculate-cordate at the base :

Peduncles clothed with few very short spreading hairs ; tertiary nerves lax and more or less reticulate ; leaflets lanceolate to linear-lanceolate, acute, obliquely and broadly wedge-shaped at the base, up to 10 cm. long and 3 cm. broad ; flowers few and clustered at the end of long peduncles ; calyx about 1·4 cm. long ; fruits bristly hairy .. .. 3. *vexillata*

Peduncles densely clothed with long sharply reflexed hairs ; tertiary nerves close and parallel ; leaflets variable, from linear to ovate-lanceolate, up to 15 cm. long and 4 cm. broad, setose-pubescent on both surfaces : flowers few at the apex of long peduncles ; calyx about 1·4 cm. long ; fruits densely bristly when young .. .. 4. *reticulata*

Leaflets broadly ovate, rounded to the apex, about 6 cm. long and 4·5 cm. broad, laxly setose on the upper surface, 3-nerved at the base ; stipules auriculate at the base ; flowers few and clustered at the apex of a long peduncle ; calyx 1·3 cm. long, minutely pubescent ; fruits beaked, about 10 cm. long, bristly pubescent 5. *Thonningii*

Calyx-lobes much shorter than the calyx-tube, sometimes quite broad :

Leaflets narrowly linear, up to 1 cm. broad :

Leaflets with very numerous lateral nerves spreading at right angles from the midrib, 6–10 cm. long, 5–8 mm. broad, strongly reticulate, glabrous ; stipules ovate-lanceolate, rounded at the base ; flowers small in short racemes ; peduncles about as long as the petiole ; fruits 6 cm. long, glabrous .. .. 6. *multinervis*

Leaflets with more or less oblique and fewer lateral nerves :

Rhachis of inflorescence with several large glands :

Calyx truncate or nearly so ; slender twiner with wiry stems : leaflets linear-lanceolate, rounded at the base, about 4·5 cm. long, laxly nervose, glabrous ; flowers few, subtended by large glands ; young fruits puberulous 7. *venulosa*

Calyx fairly deeply lobed ; suberect with a woody base ; leaflets as above but shortly pubescent below ; flowers few, the peduncle at length much elongated and thickened ; young pods densely villous .. .. .. 8. *lancifolia*

Rhachis without glands ; calyx distinctly lobed ; leaflets linear, very acute, 5–8 cm. long, nervose, glabrous ; stipules slightly auriculate : flowers solitary on peduncles about ½ as long as the leaves ; calyx glabrous ; fruit acutely beaked, 4 cm. long, glabrous .. .. 9. *stenophylla*

Leaflets broadly lanceolate to ovate :

Leaflets emarginate at the apex, glabrous, ovate to broadly oblong-lanceolate, up to 7 cm. long and 4 cm. broad ; stipules auriculate at the base ; flowers few, pedicellate ; calyx glabrous ; fruits 6 cm. long, finely pubescent .. 10. *oblonga*

Leaflets not emarginate, more or less pointed :

Standard petal pubescent outside :

Rhachis of inflorescence very short, with up to about 7 large glands ; leaflets lanceolate to ovate, mucronate, up to 10 cm. long and 4·5 cm. broad, pubescent ; stipules cordate ; flowers few, crowded ; fruits about 5 cm. long, thinly appressed-pubescent .. .. 11. *pubigera*

Rhachis of inflorescence rather long, with numerous large glands ; leaflets oblong-lanceolate, up to 12 cm. long and 3 cm. broad, pubescent ; stipules small, hastate ; fruits about 4 cm. long, thinly pubescent .. .. 12. *ambacensis*

Standard petal glabrous outside :

Stipules narrowly subulate ; leaflets hastately lobulate, 2–3 cm. long, about 2 cm. broad, thinly pubescent below ; flowers very small, subcapitate on a peduncle 3–4 cm. long ; fruits broadly linear, 2 cm. long, minutely pubescent 13. *micrantha*

Stipules broadly lanceolate to broadly ovate :

Flowers precocious ; leaflets more or less 3-lobed, silky-pubescent when young ; flowers few and clustered at the end of a very stout peduncle up to 30 cm. long ; calyx puberulous ; fruits silky-pubescent, 11 cm. long 14. *violacea*

Flowers not precocious ; leaflets never lobed :

Stipules cordate to deeply auriculate but not appendaged at the base :

Peduncle glabrous ; fruits 6–7 cm. long, bristly-setulose ; leaflets ovate-triangular, acute, about 3–4 cm. long and 1·5 cm. broad ; flowers 1·5–2 cm. long, broad .. .. 15. *nilotica*

Peduncle more or less tomentose or pubescent with reflexed hairs :

Stems shortly pubescent or nearly glabrous, very slender and wiry :

Leaflets very broadly ovate, acutely acuminate, averaging about 6–7 cm. long and 5 cm. broad ; fruits nearly 4 cm. long .. .. 16. *multiflora*

Leaflets more or less ovate-triangular, hardly acuminate, averaging about 3 cm. long and 2 cm. broad ; fruits about 2 cm. long (rarely 3 cm.) 17. *gracilis*

Stems villous with long spreading hairs ; axis of inflorescence tomentose with reflexed hairs ; leaflets broadly ovate to ovate-lanceolate, acuminate, rounded at the base, 4–9 cm. long, 3–6 cm. broad, long-pilose on the nerves below ; fruits narrowly linear, 3·5–4 cm. long, very shortly and thinly setulose .. .. 18. *racemosa*

Stipules with an entire appendage below the base ; peduncle much enlarged and thickened in fruit ; fruit in the wild form about 10 cm. long and soon dehiscent

and the valves spirally coiled, in the cultivated form about 15 cm. long and not dehiscent, not spirally twisted; calyx rather variable, teeth subulate or deltoid .. .. 19. *unguiculata*

1. **Vigna longissima** *Hutch.* in Kew Bull. 1921 : 367. A slender herb with laxly pilose prostrate or perhaps twining stems and fairly large mauve flowers.
N. Nigeria : Bauchi Plateau, between Hepham and Ropp, 4,600 ft. (July) ! Vom ! Exsicc.—*Lely* 360. *Dent Young* 71.
2. **V. angustifolia** *Hook. f.* Nig. Fl. 311. *V. vexillata*, var. γ, Bak.—F.T.A. 2 : 200. A slender subglabrous twiner with a thickened almost tuberous taproot and reddish-purple flowers.
Senegal ! Ivory Coast : Upper Sassandra, Mt. Douro, 3,400 ft. (May) ! Gold Coast : ? locality. Exsicc. —*Döllinger*. *Chev.* 21727.
3. **V. vexillata** *Benth.*—F.T.A. 2 : 199, excl. var. β ; Stapf 595 ; Chev. Bot. 202. A fairly strong twiner with often spindle-shaped tuberous root and pink or purplish flowers turning yellow.
Gambia ! Sierra Leone : Regent to Bathurst (Dec.) ! Liberia : Kakatown ! Ivory Coast : several localities. Togo : Kpedsu (Dec.) ! N. Nigeria : Lokoja and environs ! Kontagora (Oct.) ! Abinsi (Dec.) ! Common in tropical Africa and America. Exsicc.—*Barter* (no number). *Sc. Elliot* 4113. *Brown-Lester* 41. *Whyte*. *Dalz.* 31 ; 619. (See Appendix).
4. **V. reticulata** *Hook. f.*—F.T.A. 2 : 198. *V. linearifolia* Hook. f. *V. reticulata* var. β, Bak.—F.T.A. 2 : 198 ; Chev. Bot. 201. A twiner, grey or yellowish hairy, with yellow or purplish flowers ; very similar to *V. pubigera* (below).
Sierra Leone : Franziga, Tambakka country ! Ivory Coast : Baoulé Nord, Kodiokoffi (Aug.) ! Gold Coast : Accra ! Togo : Sokode-Basari ! N. Nigeria : Lokoja ! Nupe ! Argungu (Oct.) ! Katagum ! Bauchi Plateau, Naraguta and Jos (Sept.) ! Vom ! S. Nigeria : Obu ! Extends to East Africa and Angola. Exsicc.—*T. Vogel* 22. *Barter* 1017. *Sc. Elliot* 5027. *Dalz.* 40 ; 321. *Schroeder* 115. (See Appendix).
5. **V. Thonningii** *Hook. f.* Nig. Fl. 311. *Plectrotropis hirsuta* Sch. & Thonn. *V. vexillata* var. β, Bak.—F.T.A. 2 : 200. Habit, etc., of the last.
Liberia : Brewer's Landing (Nov.) ! Gold Coast : Cape Coast (Mar., July) ! Fernando Po (Nov.) ! Exsicc.—*T. Vogel* 52 ; 64 ; 222. *Dalz.* 89. *Linder* 1402.
6. **V. multinervis** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A glabrous twiner with wiry stems and blue or yellow flowers ; amongst grass, etc.
S. Nigeria : Onitsha ! Also in E. Sudan, Uganda and Angola. Exsicc.—*Barter* 1799.
7. **V. venulosa** *Bak.*—F.T.A. 2 : 203 ; Chev. Bot. 202. Habit, etc., of the last, with reddish flowers.
French Sudan : Sansanding ; Nyamina to Koulikoro ! Sierra Leone : Regent (Dec.) ! Liberia : Duport (Nov.) ! Ivory Coast : Baoulé Nord, Mbayakro. Exsicc.—*Afzelius*. *Sc. Elliot* 4038. *Linder* 1512. *Chev.* 3214.
8. **V. lancifolia** *A. Rich.*—F.T.A. 2 : 196. Suberect with striate stems, eventually twining, and reddish flowers.
N. Nigeria : Sokoto (Nov., Dec.) ! Also in Abyssinia. Exsicc.—*Moiser* 206 ; 211.
9. **V. stenophylla** *Harms* in Notizbl. Berl. Bot. Gart. 5 : 210. *V. dauciformis* A. Chev. Bot. 200. Stem suberect with trailing glabrous branches and a spindle-shaped tuberous root and bluish-purple flowers.
French Sudan : Gourma (July) ! Gold Coast : Akuse (June). Also in N. Cameroons. Exsicc.—*Dalz.* 83. *Chev.* 24521.
10. **N. oblonga** *Benth.*—F.T.A. 2 : 206. Stems glabrous, prostrate or twining amongst grass on the sea-shore ; flowers yellow.
S. Nigeria : Nun R. (Aug., Sept.) ! Brass ! Lagos, on the Marina (June) ! Victoria ! Fernando Po (Nov.) ! Also in tropical America. Exsicc.—*T. Vogel* 18 ; 221. *Barter* 1827. *Mann* 495. *Moloney*. *Dalz.* 1211. *Preuss* 1126.
11. **V. pubigera** *Bak.*—F.T.A. 2 : 201. Stems rather densely yellowish-pubescent, prostrate or widely climbing ; flowers yellow, sometimes blue or reddish ; in fallow fields or in the bush not far from cultivation.
French Sudan : Macina (Sept.) ! Gold Coast : Dukwesein, N. Ashanti ! N. Nigeria : Nupe ! Lokoja (Oct.) ! Sokoto, Argungu, etc. (Oct.) ! Katagum ! Abinsi (Dec.) ! Bauchi Plateau (Sept.) ! Also in E. Sudan. Exsicc.—*Barter* 983. *Dalz.* 39 ; 315 ; 316 ; 621. *Lely* 633. *Chev.* 24915. (See Appendix).
12. **V. ambacensis** *Welw.*—F.T.A. 2 : 201. A twiner with grey-pubescent stems and bright yellow flowers, only the upper few flowers of the raceme developed.
N. Nigeria : Abinsi (Dec.) ! Muri, in swamp (Nov.) ! Also in Angola. Exsicc.—*Dalz.* 617. *Lamb* 75.
13. **V. micrantha** *Harms* in Engl. Bot. Jahrb. 26 : 311. Stems slender, pubescent, twining amongst grass, etc., with pale yellow flowers and 2–3 -seeded fruits.
S. Nigeria : Lagos, Ikoyi (Nov.) ! Also in Congo and Uganda. Exsicc.—*Dalz.* 1216.
14. **V. violacea** *Hutch.* in Kew Bull. 1921 : 247. A fairly strong twiner with slightly pubescent grey-green stems and beautiful lavender-violet fragrant flowers appearing when leafless.
N. Nigeria : Bauchi Plateau, Naraguta, climbing around shrubs (May) ! Exsicc.—*Lely* 6.
15. **V. nilotica** *Hook. f.*—F.T.A. 2 : 204 ; Holl. 2 : 230 ; Chev. Bot. 201. A slender subglabrous twiner with fairly large yellow or purplish flowers.
Senegal : Casamance, etc. ! Gambia : Kudang (Jan.) ! Sierra Leone : Dantilia, amongst long grass (Mar.) ! Widely spread in tropical Africa. Exsicc.—*Perrottet*. *Sc. Elliot* 5295. *Dalz.* 8018.
16. **V. multiflora** *Hook. f.*—F.T.A. 2 : 205. A slender twiner with pink or bluish-purple flowers turning yellow.
N. Nigeria : Abinsi (Sept.) ! S. Nigeria : Oban ! Cameroons Mt. : Buea (Jan.) ! Fernando Po, by the shore (Nov.) ! Exsicc.—*T. Vogel* 245. *Dalz.* 618. *Talb.* (no number). *Dunlap* 139. (See Appendix).
17. **V. gracilis** *Hook. f.*—F.T.A. 2 : 205 ; Chev. Bot. 200. *V. Afzelii* Bak. *V. parvifolia* Planch.—F.T.A. 2 : 206. A slender extensively twining herb with pink or bluish flowers turning yellow ; somewhat variable in foliage.
French Sudan : Koulikoro. Senegal : Casamance R. ! Sierra Leone : Regent (Dec.) ! Freetown ! Samu country ! Liberia : Kakatown ! Monrovia (Nov.) ! So (Oct.) ! Ivory Coast : Baoulé Nord, between Bouakro and Alangouassou (July) ! Morénou (Dec.). Exsicc.—*Heudelot* 589. *Afzelius*. *Sc. Elliot* 3859. *Whyte*. *Linder* 1131 ; 1521. (See Appendix).
18. **V. racemosa** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Clitoria racemosa* G. Don. *Vigna Donii* Bak.—F.T.A. 2 : 202. *V. nigritia* Hook. f. *V. luteola* Bak.—F.T.A. 2 : 205, not of Benth., excl. syn. *V. villosa* Savi. A fairly strong twiner amongst grass or on trees, with flowers either bright blue or pink or purple-tinged, turning yellow.
Common from Gambia to Nigeria, and extending to Gabon, Angola and Rhodesia. Exsicc.—*T. Vogel* 14. *Barter* 1009 ; 1599 ; 1748. *Irving* 88. *Ingram*. *Dalz.* 25 ; 317. (See Appendix).
19. **V. unguiculata** *Walp.* Rep. 1 : 779. *Dolichos unguiculatus* Linn. *V. sinensis* Endl.—F.T.A. 2 : 204. *V. Catjang* Walp., Holl. 2 : 228. *V. baoulensis* A. Chev. Bot. 199. Stems annual but often stout, subglabrous, twining on trees, etc. ; the common cultivated bean of the country ; flowers white and mauve-tinged or pink, reddish or yellow.
Throughout the area and in the tropics generally. (See Appendix).

57. DOLICHOS Linn.—F.T.A. 2 : 209.

Flowers in axillary fascicles or subsolitary :

Flowers up to 4 in the leaf-axils ; stems prostrate or twining or rarely erect and then with lateral prostrate branches ; leaflets penninerved :

Primary stem erect, short ; secondary shoots prostrate ; leaflets obovate-oblanceolate, mucronate, 2·5 5 cm. long, 1·5–3 cm. broad, thinly and weakly pilose below ; stipels long-subulate ; stipules broadly lanceolate, 7 mm. long ; flowers about 2 cm. long .. .. 1. *brevicaulis*

Primary stem prostrate or twining :

Fruits up to 4 cm. long, nearly 1 cm. broad, obliquely nerved ; leaflets elliptic, mucronate or emarginate, 2–4 cm. long, 1–2·5 cm. broad, very sparingly pilose below ; pedicels up to 5 mm. long ; calyx-lobes subulate-lanceolate .. 2. *biflorus*

Fruits 5–6 cm. long, less than 0·5 cm. broad, very thinly pilose on the valves ; leaflets linear-lanceolate, mucronate, 4–6 cm. long, about 1 cm. broad, thinly pubescent on both surfaces .. .. 3. *stenophyllus*

Flowers usually more than 4 in the leaf-axils ; stems all erect, simple or subsimple ; leaflets with 3 prominent parallel nerves, at first softly pilose below, at length glabrous or nearly so, up to 15 cm. long and 4·5 cm. broad ; petiole up to 1·5 cm. long ; fruits 6 cm. long, 1 cm. broad, glabrous ; calyx-lobes more or less ciliate .. 4. *Lelyi*

Flowers racemose :

Terminal leaflet entire or somewhat undulate ; racemes terminal or terminating lateral leafy branches :

Leaves subsessile or petiole under 1 cm. long ; leaflets rounded and emarginate at the apex, obovate or obovate-elliptic, 3·5–5 cm. long, 2–3·5 cm. broad, thinly pubescent to nearly glabrous below and conspicuously reticulate ; stipules very broadly ovate ; corolla 2 cm. long ; fruits 5–6 cm. long, glabrous .. 5. *Dinklagei*

Leaves long-petiolate ; leaflets acuminate, very broadly ovate, mostly abruptly cuneate at the base, 6–12 cm. long, up to 10 cm. broad, glabrous or nearly so below ; stipels lanceolate, 5 mm. long, ribbed ; flowers on long stiff racemes, fasciculate on the peduncle ; fruit broadly and slightly falcate, about 6 cm. long and 2 cm. broad, beaked by the persistent style, glabrous .. .. .. 6. *Lablab*

Terminal leaflet shortly 3-lobed ; racemes axillary, leafless, very long and slender ; flowers shortly pedicellate ; leaflets very broadly and obliquely ovate, acute, thinly pubescent below, up to about 12 cm. long ; stipels spreading, linear-subulate, 4–5 mm. long ; fruits 12–15 cm. long, 1·5 cm. broad, softly tomentellous .. 7. *pseudopachyrhizus*

1. **Dolichos brevicaulis** *Bak.*—F.T.A. 2 : 211. Suberect, woody below, with trailing grey-pubescent branches and yellow flowers.
N. Nigeria : Jebba ! Yola (Sept.) ! Bauchi Plateau, Naraguta and Jos (Sept.) ! Alkalire (Sept.) ! Exsicc.—*Barter* (no number). *Dalz.* 306. *Lely* 562 ; 639.

2. **D. biflorus** *Linn.*—F.T.A. 2 : 210 ; Holl. 2 : 234. *D. occidentalis* Harms. *D. Baumannii* Harms. Trailing or twining, 1–3 ft. long, amongst grass, etc. ; flowers pale yellow.
Togo : Misahöhe. Bismarckburg (Sept.) ! N. Nigeria : Nupe ! Lokoja (Sept.) ! Abinsi (Aug.) ! Katagum (Oct.) ! Bauchi Plateau, common ! S. Nigeria : Lagos, Ikoyi ! Common in tropical Africa and in tropical Asia. Exsicc.—*Barter* 967 ; 1591. *Dalz.* 45 ; 593. *Buettner* 225. *Lely* 352 ; 470 ; 578. (See Appendix).

3. **D. stenophyllus** *Harms* in Engl. Bot. Jahrb. 26 : 314. *D. chrysanthus* A. Chev. Bot. 204. Stems twining or trailing from a woody base, slender, pubescent.
Ivory Coast : Baoulé (Aug.) ! Togo : Sokode-Basari, in savannah ! Bismarckburg. Exsicc.—*Schroeder* 90 ; 116. *Chev.* 22427.

4. **D. Lelyi** *Hutch.* in Kew Bull. 1921 : 247 ; l.c. 368, fig. 3. *D. carnosus* A. Chev., name only.
French Guinea : Kouroussa (May) ! Kaba Valley (May) ! Timbo to Farana (Apr.–May) ! Kankan ! Gold Coast : between Tamale and Yendi, abundant (Apr.) ! N. Nigeria : Bauchi Plateau, common ! Also in N. Cameroons. Exsicc.—*Lely* 44 ; 208 ; 215. *Hill* 27. *Dalz.* 49. *Dent Young* 75. *Pobéguin* (no number). *Chev.* 13248 ; 13347 bis ; 13356 ; 15749. (See Appendix).

5. **D. Dinklagei** *Harms* in Engl. Bot. Jahrb. 45 : 315. *Tephrosia subalpina* A. Chev. Bot. 181. A half-shrubby plant, 3 ft. high, with more or less angular branches and bluish or dull yellow flowers.
French Guinea : from Kindia to Konakry. Sierra Leone : York Pass ! Banikoro (Oct.) ! Liberia : Monrovia ! Duport (Nov.) ! Ivory Coast : summit of Mt. Goula, near Danané, 1,350 ft. (Apr.) ! Exsicc.—*Lane-Poole* 435. *Thomas* 2901 ; 2907. *Chev.* 21225. *Linder* 1464.

6. **D. Lablab** *Linn.*—F.T.A. 2 : 210 ; Holl. 2 : 234 ; Chev. Bot. 204. *Lablab vulgaris* Savi. A climbing perennial with glabrous or pubescent stems and white or red-tinged flowers.
Commonly cultivated on fences, roofs, etc. ; general in the tropics. (See Appendix).

7. **D. pseudopachyrhizus** *Harms* in Engl. Bot. Jahrb. 26 : 320 ; Engl. Pflanzenw. Afr. 3, 1 : 680, fig. 312. A strong climber with glabrous or pale silky-pubescent stems, sometimes suberect, with rather small blue-purple flowers.
Togo. N. Nigeria : Nupe ! Moruba, Sokoto Prov. (June) ! Abinsi, in Munchi country (Feb.) ! R. Benue ! Panyam (July) ! S. Nigeria : Lagos ! Extends to E. Africa and the Congo. Exsicc.—*Barter* 1625. *MacGregor* 201. *Dalz.* 555 ; 604. *Lely* 419. (See Appendix).

58. ADENODOLICHOS Harms in Engl. Bot. Jahrb. 33 : 180 (1904).

Shrub ; young parts reddish-tomentose ; leaves opposite, trifoliolate, occasionally 5-foliolate, stipellate ; leaflets subequal, broadly ovate, rounded and mucronate at the apex, rounded at the base, 7–18 cm. long, 5–15 cm. broad, strongly nerved, rusty-pubescent on the nerves and gland-dotted below ; flowers in lax terminal panicles with elongated branches ; calyx tomentose, about 1 cm. long, lobes oblong-lanceolate, subacute ; fruits oblong, sharply beaked, 4–5 cm. long, 1–3-seeded, loosely tomentose *paniculatus*

A. paniculatus *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Dolichos paniculatus* Hua. *A. macrothyrsus* Harms l.c. *Dolichos macrothyrsus* Harms. An erect half-woody plant of shrubby habit, up to 15 ft. high, with pinkish flowers.
French Guinea: Futa Jallon, Timbo! N. Nigeria: Zungeru! Kontagora (Dec.)! Ruka (Feb.)! Katagum! Yola (Oct.)! Bauchi Plateau (July)! Also in French Cameroons and E. Sudan. Exsicc.—*Miquel* 72. *Dalz.* 37; 400. *Shaw* 82. *Lely* 398. *Dent Young* 77. (See Appendix).

59. VOANDZEIA Thouars—F.T.A. 2 : 207.

A herb with prostrate rooting branches fruiting below the soil; leaves trifoliolate, long-petiolate, stipellate; leaflets lanceolate to narrowly elliptic, emarginate and mucronate, narrowed to the base, the terminal one 6–8 cm. long, 1·5–2·5 cm. broad, more or less 5-nerved at the base, glabrous; flowers usually in pairs on a hairy peduncle with a swollen glandular apex which pushes into the ground drawing in the flowers; calyx glabrous, with short broad teeth; fruits rounded, wrinkled when dry, about 2 cm. in diam.; seeds rounded, smooth, hard, varying in size and colour, up to about 1·5 cm. broad .. .. *subterranea*

V. subterranea *Thouars*—F.T.A. 2 : 207; Harms in Notizbl. Berl. Bot. Gart. 5 : 253; Holl. 2 : 231; Chev. Bot. 203.
Probably indigenous, and cultivated throughout tropical Africa and in some other countries. (See Appendix).

60. KERSTINGIELLA Harms in Ber. Deutsch. Bot. Ges. 26a : 230, t. 3 (1908).

A herb with prostrate rooting branches fruiting below the soil; leaves trifoliolate, long-petiolate, stipellate; leaflets elliptic-obovate, mucronate, broadly narrowed at the base, 5–8 cm. long, 4–5·5 cm. broad, 3-nerved at the base, glabrous; flowers axillary, subsessile, about 1 cm. long; calyx thinly pilose, deeply divided with narrow segments; fruits on a carpophore up to 2 cm. long, 1–3-seeded, in the latter case constricted between the seeds, up to 2 cm. long, reticulate; seeds somewhat kidney-shaped, 1 cm. long, rich brown, with the scar near the middle .. .. *geocarpa*

K. geocarpa *Harms* l.c.; Stapf in Kew Bull. 1912 : 209, with figure; Chev. Bot. 203. *Voandzeia Poissonii* A. Chev.; Holl. 2 : 231. *V. geocarpa* A. Chev.
Cultivated from Middle Niger and Gold Coast to Nigeria. Exsicc.—*Kersting* A. 476–478. *Elliott* 200. *Lamb* 8. *Andrew.* (See Appendix).

61. PSOPHOCARPUS Neck.—F.T.A. 2 : 208.

Leaves trifoliolate :
Stems, lower surface of the leaflets and rhachis of the inflorescence softly tomentellous; leaflets broadly rounded at the base; stipels pubescent; bracts and calyx appressed-pubescent; fruits 4-winged, 5–6 cm. long, 1·5 cm. broad, 4-seeded, glabrous 1. *palmettorum*
Stems, lower surface of the leaflets and rhachis of inflorescence glabrous or nearly so; leaflets broadly cuneate at the base, sometimes shortly trilobed; bracts and calyx glabrous or nearly so; fruits as above but about 6-seeded .. 2. *palustris*
Leaves 1-foliolate; leaflet shortly petiolulate, ovate, rounded at both ends, mucronate, 5–7·5 cm. long, 4–4·5 cm. broad, pubescent on the strong nerves and veins below; stipules broadly lanceolate, 8 mm. long, pubescent; racemes 15 cm. long; calyx glabrous outside; young fruits villous .. .. 3. *monophyllus*

1. **P. palmettorum** *Guill. & Perr.* Tent. Fl. Seneg. 222. *P. longepedunculatus* Bak.—F.T.A. 2 : 208, partly, not of Hassk. A twiner with blue flowers and half-woody stem climbing on palms, etc., in swampy places.
Senegal: near Cape Verde (fr. June–July); ? locality! Gambia: Kudang (Jan.)! Liberia: Peahtah (Oct.)! N. Nigeria: Nupe! Kontagora (Oct.)! Also in E. Sudan. Exsicc.—*Barter* 960. *Farmar* 39. *Dalz.* 17; 8016. *Linder* 1019.

2. **P. palustris** *Desv.* in Ann. Sci. Nat. Ser. 1 : 420; Chev. Bot. 203. *P. longepedunculatus* Hassk.—F.T.A. 2 : 208, partly; Holl. 2 : 233. A twiner with fairly conspicuous blue flowers, like the last.
French Sudan: Bafaga (Apr.). Dahomey: Porto Novo (Jan.)! S. Nigeria: Lagos! Calabar! Oban! Extends to Angola. Exsicc.—*Thomson* 116. *Millen* 69. *Talb.* 1318. *Chev.* 22719. (See Appendix).

3. **P. monophyllus** *Harms* in Engl. Bot. Jahrb. 40 : 43; Chev. Bot. 203. A rather woody plant up to 3 ft. high; flowers blue in axillary racemes.
French Sudan: Samorokiri (May)! Ivory Coast: Mankono (July)! Exsicc.—*Chev.* 888; 21972.

62. TERAMNUS Swartz—F.T.A. 2 : 180.

Twiner; stems softly pubescent or pilose; leaves trifoliolate; leaflets ovate to ovate-lanceolate, subacute, 3–5 cm. long, 1·5–2·5 cm. broad, closely appressed-pilose below; lateral nerves about 5 pairs; stipules lanceolate, pubescent; racemes few-flowered, axillary, about as long as the leaves; calyx appressed-pilose; fruits linear, flat, 4–6 cm. long, sparingly pubescent .. .. *labialis*

T. labialis *Spreng.*—F.T.A. 2 : 180; Chev. Bot. 194. A perennial twiner with reddish flowers.
Senegal: on the banks of the Senegal R. (Jan.! French Guinea: Kouria (Sept.). Ivory Coast: Middle Comoé, between Ebrinahoué and Diangobo (Dec.). Dahomey: Zagnanado, Hollis country (Feb.). S. Nigeria: Lagos! ? locality! Common in the tropics and subtropics. Exsicc.—*Heudelot. Millen* 61; 114. *Thomas* 1810.

63. CANAVALIA DC.—F.T.A. 2 : 189.

Stems creeping; leaflets broadly obovate or suborbicular, widely emarginate and mucronate, up to 10 cm. in diam., thin, glabrous, with about 5 pairs of prominent lateral nerves, laxly reticulate between the nerves; stipels very small; flowers few on a stout axis, shortly pedicellate; calyx about 1 cm. long, shortly pubescent outside, the uppermost lobe broadly ovate; corolla about 2·5 cm. long; fruit broadly linear, 15 cm. or more long, with 2 very close ribs near the upper suture . . . . . 1. *obtusifolia*

Stems climbing; leaflets ovate or ovate-elliptic, acute or acutely acuminate, broadly cuneate at the base, up to 20 cm. long and 10 cm. broad, glabrous, with 6–7 pairs of lateral nerves; flowers more or less as above; fruit variable, sword-shaped, elongate, 30 cm. long or more, with 2 longitudinal ribs near the upper suture; seeds narrowly ellipsoid, smooth . . . . . 2. *ensiformis*

1. **C. obtusifolia** *DC.*—F.T.A. 2 : 190; Stapf 595; Holl. 2 : 222; Chev. Bot. 197. *C. rosea* DC. Dunn in Kew Bull. 1922 : 138. A nearly glabrous trailing plant, with rose or purple flowers.
Common on maritime shores and estuaries in the tropics of both hemispheres; sometimes cultivated. Exsicc.—*Barter* 53; 1846. *Whyte. Chipp* 57. *Dalz.* 1212. *Talb.* 3089. *Debeaux* 149. *Preuss* 1281. (See Appendix).

2. **C. ensiformis** *DC.*—F.T.A. 2 : 190; Holl. 2 : 221; Chev. Bot. 196. *C. gladiata* DC.—Dunn in Kew Bull. 1922 : 134. *C. regalis* Dunn. *C. africana* Dunn. Climbing on fences and trees; flowers rose, mauve or white with a red base.
A familiar plant in the tropics of both hemispheres, usually found in cultivation. Exsicc.—*Barter* 1607. *MacGregor* 177. *Foster* 129. *Lely* 387. *Talb.* 233T. (See Appendix).

64. DIOCLEA H. B. & K.—F.T.A. 2 : 189.

Woody climber; branches pilose; leaves trifoliolate; leaflets ovate-elliptic, rounded at the base, abruptly acuminate and mucronate, up to about 15 cm. long and 10 cm. broad, thinly pilose; lateral nerves 7–8 pairs; stipules peltate, acute; stipels filiform; inflorescence stiff and woody, racemose, longer than the leaves; bracts narrowly lanceolate, about 1·5 cm. long; calyx rusty-pubescent; standard reflexed; fruit elliptic-orbicular to oblong, 10 cm. or more long, about 4–5 cm. broad, rather woody, pilose, 1–3-seeded; seed semi-orbicular, about 3·5 cm. long, with a conspicuous hilum encircling it for $\frac{3}{4}$ its circumference . . . . . *reflexa*

D. reflexa *Hook. f.*—F.T.A. 2 : 189; Stapf 595; Chev. Bot. 196. A hairy woody climbing shrub, with conspicuous erect racemes of red flowers.
In the tropics of both hemispheres. Exsicc.—*T. Vogel* 3; 32; no number. *Mann* 2217. *Sc. Elliot* 4193; 4669. *MacGregor* 98. (See Appendix).

65. ABRUS Linn.—F.T.A. 2 : 174.

Branchlets and lower surface of leaflets glabrous or slightly pubescent:

Seeds bright red with a black base; ripe fruits becoming warted, broadly oblong; leaflets rather numerous and small, oblong, up to 2 cm. long and 0·8 cm. broad; racemes stiff, becoming recurved; flowers rather crowded . . 1. *precatorius*

Seeds black; ripe fruits not warted, narrowly oblong; leaflets narrowly oblong, 2·5–3 cm. long, 1–1·5 cm. broad; racemes rather small and slender . . 2. *pulchellus*

Branchlets and lower surface of leaflets densely pubescent; seeds small and blackish; ripe fruits narrowly oblong, shortly pubescent, 5–6 cm. long; leaflets oblong, conspicuously mucronate, 1–2 cm. long, 0·6–0·8 cm. broad; racemes rather long and slender, hairy all over; flowers in rather distant small clusters . . 3. *canescens*

1. **A. precatorius** *Linn.*—F.T.A. 2 : 175; Holl. 2 : 209; Chev. Bot. 193. A woody twining shrub, with rather stout racemes of lilac or reddish-purple flowers and clustered fruits which burst, exposing the brilliant red and black seeds.
Found all over the tropics and subtropics. Exsicc.—*Roger. Kirk* 10. *Mann* 30. *Sc. Elliot* 4122. *Talb.* 184; 184a; 1309; 3013. *Warnecke* 202. (See Appendix).

2. **A. pulchellus** *Wall.*—F.T.A. 2 : 175; Chev. Bot. 193. A climbing shrub like the preceding; flowers light red.
French Sudan: Tabacco (Oct.)! Senegal: Casamance, Ziguinchor. French Guinea: Futa Jallon! Liberia: Gbanga! N. Nigeria: Lokoja (fl. and fr. Oct.)! Nupe! S. Nigeria: Onitsha! Ibadan (Dec.)! Also in Africa generally and in the Eastern tropics. Exsicc.—*Heudelot* 685. *Barter* 1749.

3. **A. canescens** *Welw.*—F.T.A. 2 : 175; Chev. Bot. 193. A climbing shrub with grey-pubescent foliage and usually deep red-purple flowers.
French Guinea: Kouroussa (fr. Sept.)! Futa Jallon, near Kouria (Sept.); Grandes Chutes (Dec.). Sierra Leone: Scarcies R., Kitchom! Likuru, Talla Hills (fr. Feb.); Liberia: Gbanga (Sept.)! Ivory Coast: between Bingerville and Potou Lagoon (Feb.); Anoumaba (Nov.). Gold Coast: Tanosu (Sept.)! N. Nigeria: Jebba! Lokoja (Oct., Nov.)! S. Nigeria: Igbogila (Oct.)! Extends south to Angola. Exsicc. —*Barter* (no number). *Sc. Elliot* 4312; 4970. *Dalz.* 14; 15. *Punch* 32. *Linder* 688.

66. STYLOSANTHES Swartz—F.T.A. 2 : 155.

Young parts not bristly:

Branches softly glandular-pubescent or tomentose, never bristly; leaflets elliptic or lanceolate-elliptic, very acute, 1·5–2 cm. long, with ascending nerves, thinly pubescent below; fertile flower without an accessory barren one; lower part of calyx-tube as long as the corolla, slender and glabrous; fruits pubescent, with 2 segments . . . . . 1. *viscosa*

Branches glabrous, not glandular; leaflets mostly narrowly lanceolate, acute, 1·5–2·5 cm. long, glabrous or nearly so; fertile flower with one or two sterile ones at the base; lower part of calyx-tube a little longer than the corolla, slender and glabrous; fruits glabrous or nearly so .. .. 2. *erecta*

Young parts very bristly-pilose; leaflets narrowly lanceolate, acute, 1·5–2·5 cm. long, glabrous .. .. 3. *guineensis*

1. **S. viscosa** *Ser.*—F.T.A. 2 : 156. *S. mucronata* Bak.—F.T.A. 2 : 157, partly, not of Willd. Stiffly viscous branched undershrub, 1–3 ft. high; flowers small, yellow.
Senegal: Senegal River! Sierra Leone. N. Nigeria: various localities, in grass! Also in tropical America. Exsicc.—*Michelin. Roger* 59. *Barter* 1632. *Dalz.* 46. *Lely* 178. *Moiser* 16; 93. (See Appendix).
2. **S. erecta** *P. de Beauv.*—F.T.A. 2 : 156; Chev. Bot. 187. Like the above but glabrous.
Throughout the area and generally in tropical Africa. (See Appendix).
3. **S. guineensis** *Schum. & Thonn.* Pl. Guin. 357. *S. Bogeri* Vogel—F.T.A. 2 : 157.
Togo: Lome! Dahomey: Kotonu (Jan.)! S. Nigeria: near Lagos! Extends to the Mascarene Islan 's. Exsicc.—*Rowland. Cher.* 22691. *Warnecke* 170.

67. ZORNIA Gmel.—F.T.A. 2 : 158.

Stems herbaceous from a woody base; leaves 2-foliolate; leaflets linear-lanceolate, acute, up to 4 cm. long, glabrous or slightly pubescent; stipules with an entire lanceolate appendage at the base and a lanceolate blade, leafy, about 1–1·5 cm. long; bracts similar to stipules but broadly ovate and with a shorter appendage and ciliate; flowers in lax racemes, hidden by the subtending bract; calyx pilose; fruits 2–4-seeded, segments covered with puberulous bristles up to 3 mm. long 1. *diphylla*

Stems short from a woody stock; leaves 2-foliolate; leaflets narrowly lanceolate, acute, 3–4 cm. long, about 8 mm. broad, shortly pubescent but not glandular; stipules narrowly lanceolate, appendaged, about 1·3 cm. long, nerved; bracts broadly ovate-elliptic, about 1 cm. long, shortly pubescent; fruits up to 3 cm. long, up to 5-seeded, segments densely covered with slender puberulous bristles about 5 mm. long 2. *Lelyi*

1. **Z. diphylla** *Pers.*—F.T.A. 2 : 158; Holl. 2 : 206; Chev. Bot. 188. A glabrous herb with loosely branched wiry stems, sometimes 3–4 ft. long; flowers small, purplish.
Throughout the area; a common tropical weed. Exsicc.—*Heudelot. Guillemin. Roger. Barter* 1626. *Poëguin* 1161. *Warnecke* 285; 287. (See Appendix).
2. **Z. Lelyi** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. Stems erect, 6–12 in. high, pubescent at first.
N. Nigeria: Nabardo, 2,300 ft. (May)! Also in E. Shari. Exsicc.—*Lely* 205.

68. ARACHIS Linn.—F.T.A. 2 : 157.

Stems herbaceous, pilose; leaves paripinnate; leaflets 2 pairs, obovate, mucronate and sometimes emarginate, 3–4 cm. long, 1·5–2·5 cm. broad, with numerous parallel lateral nerves; rhachis flat above, pilose on the margin; stipules adnate to the petiole for about 1 cm., free part linear-lanceolate, very acute, 1·5–2 cm. long, nervose, ciliate; flowers axillary, solitary, the lower fertile ones subsessile and burying their fruits in the soil .. .. *hypogaea*

A. hypogaea *Linn.*—F.T.A. 2 : 158.
Generally cultivated throughout the tropics. (See Appendix).

69. ORMOCARPUM P. Beauv.—F.T.A. 2 : 142.

Leaves compound:
Leaflets rounded or mucronate at the apex, up to 2 cm. long:
Branchlets, leaflets, calyx and fruits softly pubescent; leaflets 6–8 pairs, elliptic, mucronate, 0·5–1 cm. long; flowers few in short racemes on short arrested branchlets; pedicels about 1·5 cm. long, with a pair of ovate leafy bracteoles near the apex; calyx about 8–10 mm. long; corolla 2 cm. long; fruits 5–6-seeded, segments elliptic, at length coarsely reticulate .. .. 1. *bibracteatum*
Branchlets, leaflets, etc., glabrous or nearly so; leaflets 5–10 pairs, elliptic-obovate, mucronate and sometimes emarginate, 1–2 cm. long; flowers on the young shoots, few; pedicels 1–1·5 cm. long, with a pair of lanceolate-acuminate bracteoles near the apex; calyx about 8 mm. long, sometimes (like the pedicels and branchlets) setulose-warted outside; corolla 1·5 cm. long; fruits variable, 1–6-seeded, segments about 1 cm. long, obliquely elliptic, longitudinally striate 2. *guineense*
Leaflets acutely acuminate, 7–11 cm. long, 3–4·5 cm. broad, oblong-elliptic, glabrous, about 5–6 to each leaf: stipules lanceolate, 7 mm. long; flowers in scabrid-hispid racemes; fruits 5–7-seeded, shortly bristly, about 8–10 cm. long 3. *megalophyllum*

Leaves unifoliolate; leaflet lanceolate to ovate-lanceolate, acutely acuminate, 8–14 cm. long, up to 5 cm. broad, glabrous; petiolule articulated below the apex; flowers few on a short axillary raceme; pedicels about 5 mm. long, with a pair of ovate-lanceolate bracteoles near the apex; calyx about 5 mm. long, glabrous; corolla nearly 1·5 cm. long; fruits up to 5-seeded, segments narrowly elliptic, warted and longitudinally nerved .. .. 4. *verrucosum*

1. **Ormocarpum bibracteatum** *Bak.*—F.T.A. 2 : 143. A shrub or small tree with short stout branches, grey-pubescent all over; corolla reddish, lurid purple-veined and mottled, becoming dry and papery and persistent.
Senegal: Ferlo! N. Nigeria: Kontagora (Jan.)! Sokoto Prov. (Dec.)! Katagum! Ringa (Feb.)! Also in N.E. Tropical Africa. Exsicc.—*Heudelot* 157. *Dalz.* 42; 313; 424. (See Appendix).
2. **O. guineense** *Hutch. & J. M. Dalz. O. sennoides* DC.—F.T.A. 2 : 143; Chev. Bot. 185. *Robinia guineensis* Willd. A much-branched shrub, 4–12 ft. high; flowers yellow with reddish streaks.
French Guinea: in the bush between Kouria and Ymbo. Sierra Leone: Scarcies R., Kambia (fr. Dec.)! Freetown (fr. Apr.)! Liberia: Peahtah (Oct.)! Ivory Coast: Bouroukrou. Gold Coast: Aburi (Nov.)! Axim (Apr.)! Accra Plains (Nov.)! Togo: Lome! N. Nigeria: Agative, near Abinsi (June)! S. Nigeria: Ebute Metta! Aguku! Oban! Man-of-War Bay, Cameroons (Apr.)! Extends eastwards through tropical Asia to N. Australia. Exsicc.—*Sc. Elliot* 4374; 5873. *Millen* 33. *Johnson* 1099. *Farmar* 429. *Talb.* 1403. *Schlechter* 12385. *Warnecke* 54. *Linder* 925.
3. **O. megalophyllum** *Harms* in Engl. Bot. Jahrb. 26 : 292. A shrub 3–5 ft. high, with yellow purple-veined flowers.
Liberia: ? locality, "near a spring in woods"! S. Nigeria: Oban! Victoria. Also in French Cameroons. Exsicc.—*Talb.* 1203. *Linder* 346. *Preuss* 1193.
4. **O. verrucosum** P. *Beauv.*—F.T.A. 2 : 142; Stapf 594; Chev. Bot. 185. A shrub, 10–15 ft. high, with brown-purple glabrous branchlets and white or lilac flowers purple-striped; in sandy places near water or salt marshes.
Senegal! French Guinea: Guerzé country, at the foot of Mt. Nzo; Kaoulendougou. Liberia: Mon-

FIG. 149.—HERMINIERA ELAPHROXYLON *Guill. & Perr.* (PAPILIONACEAE).
A, flowering shoot. B, standard. C, wing petal. D, keel petal. E, pistil. F, fruits. G, pith.

rovia! Grand Bassa! Duport (Nov.)! Ivory Coast: between Tabou and Bériby. S. Nigeria: Lagos (Apr., May)! Warri! Brass! Nun R.! Eket! Victoria! Fernando Po! Also in French Cameroons. Angola and Princes Island. Exsicc.—*Heudelot. T. Vogel* 14; 103; 259. *Barter* 65. *Mann* 457. *Whyte, Talb.* 3216. *Beauvois. Linder* 1473.

70. ORNITHOPUS Linn.—F.T.A. 2 : 139.

A slender herb up to 0·75 m. high; branchlets pubescent; leaves imparipinnate, 3–4 pairs, narrowly oblanceolate, about 1 cm. long, appressed-pilose; rhachis with 2 small stipular glands at the base; umbels 2–4-flowered; fruits torulose, segments 3–5, subglobose, glabrous, about 2–3 mm. diam. .. .. / .. *coriandrinus*

O. coriandrinus *Hochst.*—F.T.A. 2 : 140.
Cameroons Mt., 8,500 ft. (Nov.)! Also in Eritrea, Abyssinia to Nyasaland. Exsicc.—*Migeod* 202.

71. HERMINIERA Guill. & Perr.—F.T.A. 2 : 144.

Shrub; branchlets densely hispid and with short sharp prickles just below the ovate-lanceolate stipules; leaves paripinnate, 10–20 pairs, opposite or alternate, oblong, mucronate, about 2 cm. long, slightly ciliate; leaf-rhachis often with sharp subulate

prickles on the lower side ; flowers 2–3 in short axillary racemes : pedicels about 1 cm. long, densely setose ; calyx about 2 cm. long, scabrid-pubescent ; corolla large, 4 cm. long ; fruits spirally coiled, about 1 cm. broad, setulose .. *elaphroxylon*

H. elaphroxylon *Guill. & Perr.* Tent. Fl. Seneg. 201, t. 51 ; F.T.A. 2 : 144 ; Holl. 2 : 199. *Aeschynomene tchadica* A. Chev. A shrub, 8–20 ft. high, of rivers and swamps ; flowers conspicuous, orange-yellow.
Senegal : Lake Guier ! N. Nigeria : Nupe ! Gold Coast : Lower Volta, Dabalah, near Ada ! All over tropical Africa and in Madagascar. Exsicc.—*Heudelot. Lelièvre. Barter* 757. (See Appendix).

72. AESCHYNOMENE Linn.—F.T.A. 2 : 145.

Stipules not produced into an appendage beyond the base :
Flowers nearly 1 cm. long ; stipules long-subulate-acuminate, about 1 cm. long, soon falling off, closely nerved ; leaflets narrowly oblong, sharply mucronate, glabrous ; racemes few-flowered, up to 12 cm. long ; pedicels about 5 mm. long ; fruits 1–2-seeded, segments semilunar, glabrous .. .. 1. *abyssinica*
Flowers up to 0·6 cm. long ; stipules acute or shortly acuminate ; fruits with 1–2 segments, warted :
Rhachis of inflorescence very zigzag and slender ; flowers very small, about 3 mm. long ; branches usually spreadingly pilose ; bracts toothed .. 2. *lateritia*
Rhachis of inflorescence comparatively straight or slightly zigzag ; flowers about 0·6 cm. long ; branchlets shortly setulose :
Bracts toothed ; stipules ovate, broad .. .. 3. *pulchella*
Bracts entire ; stipules narrowly lanceolate .. .. .. 4. *Kerstingii*
Stipules produced beyond the base into a long auricle or appendage :
Leaflets closely and distinctly toothed, about 3 cm. long ; stipules very large, with one side much produced at the base, up to 2·5 cm. long ; stems thick and pithy ; flowers 3–4 at the apex of axillary peduncles, about 1·3 cm. long ; pedicels scabrid ; fruits narrowly oblong, slightly undulate, about 4 cm. long, coarsely reticulate 5. *crassicaulis*
Leaflets entire or nearly so, rarely up to 2·5 cm. long :
Flowers about 3 cm. long, the keel with a large crest on the margin ; stipules lanceolate, very acute, 2 cm. long, closely nerved, much produced at the base ; leaflets about 20 pairs, oblong-oblanceolate, about 1·5 cm. long, veiny ; fruits about 8 cm. long, glabrous .. .. 6. *cristata*
Flowers much smaller than above, the keel not crested or only very slightly so :
Stems quite smooth, herbaceous :
Stems thick and soft ; leaflets very numerous, up to 2 cm. long ; flowers few, axillary, up to 2 cm. long ; fruits undulate on one side, 7 cm. long, 6–10-seeded, segments closely warted .. .. 7. *aspera*
Stems slender ; leaflets 10–20 pairs, up to 1 cm. long ; flowers few on slender leafy racemes, about 5–7 mm. long ; fruits undulate on one side, up to 9-seeded, nearly smooth .. .. 8. *indica*
Stems more or less muricate or setose, rather woody :
Calyx-lobes glabrous outside ; branches flexuose ; leaflets up to 20 pairs, about 1 cm. long ; flowers very few, about 8 mm. long ; fruits rather deeply indented on one side, about 4 cm. long, up to 9-seeded, segments very sparsely pubescent 9. *sensitiva*
Calyx-lobes bristly-pubescent outside :
Fruits deeply indented on one side, warted and pubescent ; stems setulose-pubescent ; leaflets and fruits as in preceding but the latter finely warted 10. *uniflora*
Fruits straight on both margins, glabrous, 3–4 cm. long ; flowers solitary, about 1 cm. long ; leaflets about 9 pairs, very small and close .. 11. *Schimperi*

1. **Aeschynomene abyssinica** *Vatke* in Oest. Bot. Zeitschr. 29 : 224. *A. Ruppellii* Baker—F.T.A. 2 : 149. *Ruppellia abyssinica* A. Rich. Fl. Abyss. 1 : 203, t. 37. An undershrub 2–6 ft. high, with dark brown rather viscid branches and yellow purple-veined flowers.
N. Nigeria : Alkalire ! Vom, 3,000–4,500 ft. ! Also in French Cameroons and from Abyssinia to Rhodesia. Exsicc.—*Lely* 641. *Dent Young* 60.
2. **A. lateritia** *Harms* in Engl. Bot. Jahrb. 26 : 292. A slender prostrate much-branched herb, with wiry stems and very small yellow flowers.
N. Nigeria : Abinsi (Feb.) ! Yola (Sept.) ! Keana, Nassarawa Prov. (Oct.) ! Bauchi Plateau, Naraguta and Jos (Sept.) ! Extends to Angola. Exsicc.—*Dalz.* 305 ; 599. *Lely* 570. *Hepburn* 42.
3. **A. pulchella** *Planch.*—F.T.A. 2 : 149 ; Chev. Bot. 186. *A. sazicola* Taub. Branches red-brown, slightly viscous, 1 ft. or more long, from a woody base ; flowers orange-yellow.
French Sudan : Dougoura (Feb.) ! French Guinea : Futa Jallon and other localities ! Sierra Leone : Scarcies R., Buyabuya (Feb.) ! Makunde (Apr.) ! Togo : Agome ! Uati Mts. (Apr.) ! Exsicc.—*Guillemin* 739. *Sc. Elliot* 4131 ; 5713. *Chev.* 332. *Poëguin* 947. *Schlechter* 12958. *Baumann* 269.
4. **A. Kerstingii** *Harms* in Engl. Bot. Jahrb. 54 : 385. Herbaceous or half woody, with slender stems ; flowers golden yellow.
Togo : Basari, near Dadaure (July) ! Exsicc.—*Kersting* 176.
5. **A. crassicaulis** *Harms* in Engl. Bot. Jahrb. 40 : 38 ; Chev. Bot. 186. Stems procumbent and rooting in mud, often half submerged ; flowers yellow ; fruits 1–1½ in. long, shortly stipitate. (See Appendix).
French Sudan : Upper Volta, Fada N'Gourma (July) ! Ségou (Sept.) ! N. Nigeria : Sokoto ! Katagum (July) ! Extends to Chad Terr. Exsicc.—*Dalz.* 10.
6. **A. cristata** *Vatke* in Oest. Bot. Zeitschr. 28 : 215. A soft-stemmed undershrub ; branches and peduncles at first setose, becoming glabrous ; flowers conspicuous.

Dahomey: Avrankou Lagoon (Jan.)! S. Nigeria: Lagos! Lagos Colony, Yewa River (Sept.)! Also in Shari-Chad, E. Africa, Rhodesia and Madagascar. Exsicc.—*Millen* 96. *Punch* 19. *Chev.* 22763.

7. **A. aspera** *Linn.*—F.T.A. 2 : 147; Holl. 2 : 200; Chev. Bot. 186. An undershrub with soft pithy stems, 3–6 ft. high; in swampy places.
French Sudan: Macina (Sept.)! N. Nigeria: Katsina Allah, Turu Swamp (Aug.)! S. Nigeria: Idah (Sept.)! Ogun R.! Also in S. Tropical Africa from Angola to Nyasaland and Transvaal. Exsicc.—*T. Vogel* 65. *Millen* 184. *Dalz.* 616. (See Appendix).

8. **A. indica** *Linn.*—F.T.A. 2 : 147; Holl. 2 : 200; Chev. Bot. 186. An undershrub 2–4 ft. high, with pale yellow faintly striate flowers; in muddy places near rivers and swamps.
French Sudan: Sansanding (fr. Sept.)! Yatenga (Aug.)! Bananiqué! Tacadji! San! Senegal: Walo and other localities uncertain! Gambia: Kudang (fr. Jan.)! Gold Coast: Cape Coast (July)! Dahomey: Zagnanado, Lake Azri (Feb.)! N. Nigeria: Katagum (fr. Oct.)! All over tropical Africa. Exsicc.—*Heudelot. Perrottet. T. Vogel* 68. *Dalz.* 11; 8021. (See Appendix).

9. **A. sensitiva** *Swartz*—F.T.A. 2 : 147; Chev. Bot. 186. An undershrub with slightly viscid branches and small bright yellow flowers.
Senegal: Casamance! French Guinea: Rio Nunez! Mamou! Kouroussa (Oct.)! Sierra Leone: Scarcies R., Kambia. All over tropical Africa, the Mascarene Islands and in tropical America. Exsicc.—*Heudelot* 689. *Sc. Elliot* 4366. *Pobéguin* 563.

10. **A. uniflora** *E. Mey.*—F.T.A. 2 : 146; Chev. Bot. 187. An undershrub with half-woody bristly branches and pale yellow flowers.
Senegal: Niayes; Kaolak. N. Nigeria: Lokoja! Also in Congo Basin and the Mascarene Islands. Exsicc.—*Barter* 516. (See Appendix).

11. **A. Schimperi** *Hochst.*—F.T.A. 2 : 146. *A. djalonensis* A. Chev. Bot. 186. An erect undershrub with half-woody branches, rough with short, almost spicular hairs; flowers small, yellow.
Gambia: Kudang (Jan.)! French Guinea: Kouria, etc.! Sierra Leone: Yonibana (Nov.)! Also in Abyssinia. Exsicc.—*Brown-Lester* 13. *Dalz.* 8022. *Chev.* 14977; 20170.

73. CYCLOCARPA Afz.—F.T.A. 2 : 151; Urb. in Jahrb. Bot. Gart. Berl. 3 : 247.

A tiny shrublet; leaves subsessile, paripinnate; leaflets 3-4 pairs, obovate-oblanceolate, mucronate, about 5 mm. long, minutely serrulate, glabrous; stipules ovate, acuminate, striate, with a long lanceolate basal appendage; flowers axillary; fruits coiled in a ring, forming 1–1½ spirals, with 9–10 segments, glabrous, about 6 mm. diam.
stellaris

C. stellaris *Afz.* ex *Oliv.*—F.T.A. 2 : 151, in obs.; Urb. l.c. 248; Chev. Bot. 189, partly. Erect or diffuse woody herb, with slender glabrous branchlets up to 8 in. long, sensitive leaves and small yellow flowers; uncommon.
French Guinea: Kouroussa! Kouria (Oct.)! Futa Jallon, between the waterfall of Ditinn and Dalaba (Sept.)! Dalaba to Diaguissa, 3,500 to 4,000 ft. (Sept.)! Sierra Leone: ? locality. Liberia: Duport, in moist sandy soil (Nov.)! N. Nigeria: Kontagora, in marshy ground (Nov.)! Also in Ubangi-Shari, Gabon, Congo and Nyasaland; has been found also in North Queensland. Exsicc.—*Afzelius. Dalz.* (no number). *Pobéguin* 462. *Caille* in *Herb. Chev.* 15030. *Chev.* 18562; 18575. *Linder* 1508.

74. SMITHIA Ait.—F.T.A. 2 : 151.

Flowers in subsessile clusters or spikes:
Flowers in short dense clusters; leaflets about 4 mm. long, 2–3-nerved; corolla about 1·5 cm. long; stipules ovate-lanceolate, acuminate, up to 1 cm. long, closely nerved, pubescent outside .. .. 1. *speciosa*
Flowers in fairly long caterpillar-like secund spikes about 2–3 cm. long; leaflets over 1 cm. long, 3–5-nerved; stipules about 1 cm. long, glabrous outside, ciliate
2. *ochreata*
Flowers in clusters on slender peduncles; leaflets oblong-lanceolate, about 4 mm. long; corolla 3–4 mm. long; stipules 5 mm. long, glabrous .. .. 3. *micrantha*

1. **S. speciosa** *Hutch.* in Kew Bull. 1921 : 365. A shrubby plant, 4–5 ft. high, branching from numerous stems, pilose with soft hairs from a swollen base; flowers deep blue.
N. Nigeria: Bauchi Plateau, Naraguta (Aug.)! Vom, 3,000–4,500 ft.! Exsicc.—*Lely* 478. *Dent Young* 61.

2. **S. ochreata** *Taub.* in Engl. Bot. Jahrb. 23 : 191; Chev. Bot. 187. An erect branched shrub like the last, 6 ft. or more high.
French Sudan: Koulikoro (Oct.)! French Guinea: Kindia; Mamou (Mar.)! Kissi; Beyla; Futa Jallon, Dalaba-Diaguissa Plateau, 3,000–4,000 ft. Sierra Leone: hills near Kassa; Sulimania (fr. Mar.)! Bullom! Dombudu (Feb.)! Sansanguela, at the sources of the Niger. Ivory Coast: Upper Cavally, summit of Mt. Gbon, 3,500 ft. Exsicc.—*Sc. Elliot* 5069. *Smythe* 116. *Macdonald* 8. *Dalz.* 8400. *Chev.* 13032; 13095; 20565; 20748; 21416. (See Appendix).

3. **S. micrantha** *Harms* in Journ. de Bot. 22 : 113; Chev. Bot. 187.
French Guinea: Bouria (Nov.)! Exsicc.—*Chev.* 14960.

75. GEISSASPIS W. & A.—F.T.A. 2 : 154.

Stems glabrous, straw-coloured; leaves very few, imparipinnate; leaflets about 3 pairs, oblong-oblanceolate, unequal-sided at the base, 1–1·3 cm. long, glabrous; stipules persistent, broadly ovate, several-nerved, 1 cm. long, glabrous; flowers in dense oblong pedunculate racemes and hidden by large imbricate reticulate orbicular-reniform bracts about 1·5 cm. broad; corolla about 0·5 cm. long; fruits very small, with 2 reticulate segments .. .. *psittacorhyncha*

G. psittacorhyncha *Taub.* in Engl. & Prantl Nat. Pflanzenf. 3, 3 : 321; Chev. Bot. 187. *Soemmeringa psittacorhyncha* Webb. *G. lupulina* Planch.—F.T.A. 2 : 155. A slightly woody herb, erect or straggling; flowers small, bright yellow within the bracts.
Senegal! French Guinea: Kouroussa (Oct.)! Kouria! Ymbo! Futa Jallon, between Timbo and Ditinn! Also in Cape Verde Islands. Exsicc.—*Heudelot* 664. *Farmar* 211. *Sc. Elliot* 3866. *Pobéguin* 568. [This may be the same as *Flemingia guineensis* G. Don, in which case the latter specific name would have priority.]

76. DESMODIUM Desv.—F.T.A. 2 : 159.

Leaves trifoliolate or rarely a few also unifoliolate :
Inflorescence a short bracteate congested very hairy raceme scarcely as long as the leaves ; further characters as below .. .. 1. *dimorphum*
Inflorescence a slender raceme or very few-flowered and not congested :
Leaflets lanceolate-elliptic or narrowly oblong, rounded at the base :
Leaflets narrowly oblong, equal at each end, about 1·5 cm. long and 0·5 cm. broad, slightly pubescent below ; stems pilose ; racemes few-flowered ; pedicels about 1 cm. long, slender ; fruits 3–7-seeded, glabrous .. .. 2. *linearifolium*
Leaflets lanceolate or elliptic, more or less narrowed to the apex :
Pedicels short, at most a little longer than the flowers :
Leaflets more or less elliptic, subacute, up to 7 cm. long and 3 cm. broad, glaucous and shortly pubescent below ; pedicels a little longer than the flower ; fruits deeply indented on one side, 3–5-seeded, shortly setulose-pubescent 3. *incanum*
Leaflets lanceolate, acute, up to 15 cm. long and 4 cm. broad, pubescent only on the nerves below ; lateral nerves numerous ; flowers very shortly pedicellate ; fruits only slightly indented, 3–5-seeded, at length reticulate 4. *paleaceum*
Pedicels long and slender, much longer than the flower ; leaflets oblanceolate-elliptic, up to 5 cm. long and 2 cm. broad, pilose on both surfaces ; fruits about 1·5 cm. long, about 6–seeded, deeply indented on one side, setulose 5. *delicatulum*
Leaflets rhomboid or obovate, at least the terminal one narrowed to the base :
Terminal leaflet more or less rhomboid or ovate-rhomboid :
Leaflets triangular-acute at the apex, up to 9 cm. long and 6 cm. broad, thinly pilose below ; stipules 1–1·5 cm. long, persistent ; flowers very few and paired on the long raceme ; pedicels up to 3 cm. long ; fruits very deeply indented, 3–5-seeded, tomentellous .. .. 6. *Scalpe*
Leaflets ovate-rhomboid, very thin, up to 8 cm. long and 4·5 cm. broad, glabrous or nearly so below ; flowers very small ; pedicels up to 1 cm. long ; fruits very deeply indented, becoming twisted, shortly pubescent .. 7. *abyssinica*
Terminal leaflet more or less obovate and rounded at the apex :
Leaflets obovate-orbicular, as broad or nearly as broad as long :
Stems erect or ascending ; terminal leaflet 2–3 cm. long or more, shortly pubescent below ; flowers few in lax racemes ; pedicels about 1 cm. long ; fruits 3–4-seeded, about ½ indented on one side, tomentellous .. .. 8. *adscendens*
Stems prostrate, more or less pilose ; terminal leaflet 1 cm. long or less, finely appressed-pilose below ; flowers few, axillary ; pedicels up to 1 cm. long ; fruits about ⅓ indented on one side, about 5-seeded, pubescent .. 9. *triflorum*
Leaflets more or less elliptic-obovate, considerably longer than broad :
Stems more or less straggling, herbaceous ; pedicels much longer than the flowers, the latter rather few and distant in the raceme ; leaflets up to 4 cm. long, thinly pilose ; fruits shortly indented on one side, about 5-seeded, pubescent 10. *hirtum*
Stems erect, rather woody ; pedicels at most only slightly longer than the flowers, the latter numerous and rather close on the racemes ; leaflets rarely over 3 cm. long ; fruits rather deeply indented, about 5-seeded, pubescent 11. *mauritianum*

Leaves all unifoliolate :
Inflorescence a slender lax-flowered raceme ; leaflet lanceolate or ovate-lanceolate, subacute or acuminate, 5–12 cm. long, 2–5 cm. broad, pilose below ; stipels subulate ; pedicels about as long as the flower ; calyx pilose ; fruits nearly straight on one side, deeply indented on the other, about 2 cm. long, thinly pubescent 12. *gangeticum*
Inflorescence a short bracteate congested very hairy raceme, scarcely as long as the leaves ; leaflets 3 or sometimes 1, oblong-elliptic, emarginate, 2–3 cm. long, densely appressed-pilose below ; stipules long-subulate-lanceolate, persistent ; bracts ovate-lanceolate, subpersistent ; pedicels as long as the flower, the latter nodding 1. *dimorphum*
Inflorescence a dense leafy subpyramidal panicle ; leaflet ovate or rhomboid, rounded at the apex, up to 15 cm. long and 8 cm. broad, softly pilose below ; petiolule rather short ; stipules triangular-subulate ; pedicels very short ; fruits deeply indented on one side, 1·5–2 cm. long, pubescent .. .. 13. *lasiocarpum*

1. **Desmodium dimorphum** *Welw.*—F.T.A. 2 : 161. A more or less woody undershrub, 1–2 or more feet high, grey-silky pubescent, with pink or purplish flowers.
French Guinea : Kouroussa (Sept.) ! N. Nigeria : Bauchi Plateau, Vom, 3,000–4,500 ft. ! Naraguta (Aug.) ! Exsicc.—*Lely* 513. *Dent Young* 64. *Pobéguin* 434.
2. **D. linearifolium** *G. Don* Gen. Syst. 2 : 294. *D. Schweinfurthii* Schindl., partly. *D. djalonense* A. Chev. A branched herb about 1 ft. high, woody at the base, with erect or spreading lax branches and small pink-mauve flowers.

French Guinea : Kouria ; Futa Jallon, Irébéléya, Timbo, Mamou. Sierra Leone : Hill Station, in rocky places (Sept.) ! Brookfields, Foni Flats, amongst grass (Oct.) ! Jigaya (Sept.) ! Kanya (Oct.) ! Bambuna (Oct.) ! Exsicc.—*Afzelius*. *Smeathmann*. *Deighton* 2162 ; 2189. *Thomas* 2828 ; 2977 ; 3276 ; 3429 ; 3832. *Caille* in *Herb. Chev.* 15028.

3. **D. incanum** *DC.*—F.T.A. 2 : 163 ; Stapf 594 ; Chev. Bot. 190. A half-woody undershrub, more or less decumbent ; flowers reddish-purple in loose racemes.
French Sudan : Folo (May). French Guinea : Futa Jallon, between Soumbalako and Boulivel (Sept.) ; Dalaba-Diaguissa Plateau (Oct.). Liberia : Monrovia. Ivory Coast : Upper Cavally. Fernando Po (June, Nov., Dec.) ! Also in Princes and St. Thomas Islands, and in tropical America and the Mascarene Islands. Exsicc.—*T. Vogel* 205. *Barter* (no number). *Mann* 56.

4. **D. paleaceum** *Guill. & Perr.*—F.T.A. 2 : 166 ; Stapf 594 ; Chev. Bot. 191. A half-woody erect undershrub, 3–4 ft. high, with red or yellowish flowers in slender more or less panicled spike-like racemes.
Throughout the area ; all over tropical Africa, and in the Mascarene Islands and S. Africa. Exsicc.—*Heudelot* 369. *T. Vogel* 21. *Sc. Elliot* 4345 ; 4871. *Millen* 104. *Whyte*. *Poéguin* 956.

5. **D. delicatulum** *A. Rich.*—F.T.A. 2 : 163. Erect or straggling branched shrublet, with very pilose branches and slender pedicels.
Sierra Leone : Kennema (Nov.) ! Juring (Dec.) ! Extends to E. Sudan, Abyssinia and Congo. Exsicc.—*Deighton* 331 ; 390.

6. **D. Scalpe** *DC.*—F.T.A. 2 : 164 ; Chev. Bot. 191. An undershrub with slender thinly spreading-pubescent branches, straggling or more or less climbing ; flowers usually deep red.
French Guinea : Futa Jallon, Dalaba-Diaguissa Plateau, 3,000–4,000 ft. (Oct.) ! between Dalaba and Sougouéta (Oct.) ! Guerzé country, Yagadou village (Mar.) ! Cameroons Mt., 2,000–7,000 ft. (Dec., Jan.) ! Fernando Po, 5,000 ft. ! In the tropics and subtropics of the Old World. Exsicc.—286 ; 1229 ; 2017.

7. **D. abyssinica** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Meibomia abyssinica* Schindl. ms. *D. spirale* Bak.—F.T.A. 2 : 160, not of DC. *Anarthrosyne abyssinica* Hochst. Erect undershrub with pubescent branches and very thin flaccid leaves and twisted fruits.
Senegal : Richard Tol ! Sierra Leone. Also in Cape Verde Islands and Abyssinia. Exsicc.—*Heudelot* 221.

8. **D. adscendens** *DC.*—F.T.A. 2 : 162 ; Chev. Bot. 189. *D. ovalifolium* Guill. & Perr. An undershrub with slender thinly pubescent branches, straggling and sometimes prostrate and rooting ; flowers pink or whitish.
Senegal ! Sierra Leone : Njala (Sept.) ! Liberia : Du River ! Bakratown ! Ivory Coast : several localities. Gold Coast : Swedru (Feb.) ! Axim (Apr.) ! Akwapim (Mar.) ! N. Nigeria : Bauchi Plateau, Naraguta (June) ! S. Nigeria : Nun R. (Aug.) ! Lagos Colony (Aug.) ! Obu ! Calabar (Apr.) ! Fernando Po (June) ! Also in St. Thomas Island and in tropical America. Exsicc.—*T. Vogel* 19. *Mann* 407. *Rowland*. *Farmar* 444. *Linder* 192 ; 866. (See Appendix).

9. **D. triflorum** *DC.*—F.T.A. 2 : 166 ; Holl. 2 : 206 ; Chev. Bot. 191. Stems much branched, prostrate, creeping and forming dense mats ; flowers pink or purplish.
French Guinea : Konakry (May), partly cultivated. Sierra Leone : Mahela (Dec.) ! Regent (Oct.) ! Liberia : Monrovia (Nov.) ! Ivory Coast : S. Baoulé, Toumodi (Aug.) ! Gold Coast : Accra ! Togo : Lome ! Dahomey : Kotonu (July) ! S. Nigeria : Lagos (June) ! Onitsha ! Ibadan ! Here and there in tropical Africa, and in the Mascarene Islands and Socotra. Exsicc.—*T. Vogel* (no number). *Barter* 1790. *Sc. Elliot* 4055. *Warnecke* 257. *Schlechter* 12335. *Linder* 1538. (See Appendix).

10. **D. hirtum** *Guill. & Perr.*—F.T.A. 2 : 163. Stems clothed with spreading silky hairs ; flowers pink or bluish.
French Sudan : Kabarah Pools (Aug.) ! Koulikoro. Senegal : Casamance ; St. Louis ; Bakel. French Guinea : Rio Nunez, swampy places ! N. Nigeria : Lokoja ! Sokoto, damp pastures (Oct.) ! Bauchi Plateau, Vom, 3,000–4,500 ft. ! S. Nigeria : Aguku ! Extends to Ubangi-Shari, Uganda and East Africa to Rhodesia, Madagascar, and south to Angola. Exsicc.—*Heudelot* 696. *Barter* (no number). *Dalz.* 338. *Chev.* 1341.

11. **D. mauritianum** *DC.*—F.T.A. 2 : 164 ; Stapf 594 ; Chev. Bot. 190. An erect slightly woody herb, with slender branches and bright pink or purple flowers.
Common throughout the area and in tropical Africa generally ; also in the Mascarene Islands. Exsicc.—*T. Vogel* 48. *Barter* 727. *Sc. Elliot* 3932 ; 3991 ; 5210 ; 5340. *Whyte*. *Warnecke* 260. *Schlechter* 12330. (See Appendix).

12. **D. gangeticum** *DC.*—F.T.A. 2 : 161 ; Chev. Bot. 190. Erect half-woody undershrub, up to 5 ft. high, with small white and pink or bluish flowers.
Throughout the area and widely distributed in the tropics of the Old World. Exsicc.—*Irving*. *Sc. Elliot* 4420. *Millen* 112 ; 158. *Talb.* 1304. *Warnecke* 434. (See Appendix).

13. **D. lasiocarpum** *DC.*—F.T.A. 2 : 162 ; Stapf 594 ; Chev. Bot. 190. A half-woody erect rather hairy undershrub, 3–6 ft. high, with small pink or purplish flowers and fruit-segments which adhere like burns.
A common plant in the tropics of the Old World. (See Appendix).

77. DROOGMANSIA Wildem. in Ann. Mus. Congo, ser. 4 : 53 (1902).

Stems erect, woody, pilose ; leaves petiolate, unifoliolate ; petiole with a broad obovate-oblanceolate foliaceous wing about 3 cm. long and 1·5 cm. broad ; leaflet oblong-lanceolate, rounded at each end, about 12 cm. long and 2·5 cm. broad, with about 8 pairs of lateral nerves, pilose on the nerves below ; racemes in the axils of the upper leaves and forming a congested panicle ; peduncle densely pilose ; bracts lanceolate, long-acuminate, 1·5 cm. long, pilose ; pedicels 8 mm. long ; flowers 1·3 cm. long ; standard striate .. .. *Chevalieri*

. **Chevalieri** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Dolichos Chevalieri* Harms.
French Guinea : Bilma (Sept.) ! Exsicc.—*Chev.* 19040.

78. ALYSICARPUS Neck.—F.T.A. 2 : 169.

Segments of fruit branched-reticulate over the surface, the joints only slightly constricted ; lower leaves elliptic, the upper sometimes lanceolate, up to 7 cm. long, reticulate, slightly pubescent ; calyx-lobes linear-lanceolate, very acute, about 4 mm. long, ribbed ; fruits about 3 cm. long .. .. .. 1. *vaginalis*

Segments of fruit transversely ribbed, the joints much constricted ; leaves narrowly oblong-elliptic or mostly linear-lanceolate, up to 9 cm. long, slightly pubescent ; calyx-lobes imbricate, ovate-lanceolate, long-ciliate, 5–6 mm. long, closely ribbed ; fruits about 1 cm. long, moniliform with 4–5 segments .. .. 2. *violaceus*

Segments of fruit smooth but pubescent ; leaves lanceolate to linear-lanceolate, up to

7 cm. long, shortly pubescent ; calyx-lobes as in above but more ciliate ; fruits about 1 cm. long, with 3–4 segments .. .. 3. *Zeyheri*

1. **A. vaginalis** *DC.*—F.T.A. 2 : 170 ; Chev. Bot. 193. Herb, woody at the base, 1–2 ft. high, sometimes more, with small reddish flowers and cylindrical wrinkled fruits.
   All over the savannah regions and grass lands ; a common tropical weed. Exsicc.—*Heudelot* 506. *Ansell. Barter* 523 ; 1592 ; 1603. *Warnecke* 278. (See Appendix).
2. **A. violaceus** *Schindl.* *A. rugosus* DC.—F.T.A. 2 : 171 ; Holl. 2 : 207 ; Chev. Bot. 192. Similar to the preceding.
   A common tropical weed. Exsicc.—*Barter* 952 ; 1777. *Brown* 364. *Chev.* 24787. (See Appendix).
3. **A. Zeyheri** *Harv.*—F.T.A. 2 : 170. A slightly woody herb like the preceding two species, 1–2 ft. high.
   N. Nigeria : Bauchi Plateau, Naraguta (June) ! Mongu, 4,300 ft. (July) ! Lemme, 2,600 ft. (May) ! Extends south to Transvaal. Exsicc.—*Lely* 135 ; 260 ; 394.

79. URARIA Desv.—F.T.A. 2 : 168.

A woody herb ; stems more or less pubescent ; leaves pinnate, the lower sometimes entire ; leaflets 2–4 pairs and a terminal one, linear-lanceolate to lanceolate, rounded at the base, mucronate, up to about 20 cm. long, strongly reticulate below with transverse tertiary nerves ; stipules large, ovate-lanceolate, acutely long-acuminate ; stipels narrowly lanceolate, acuminate ; racemes terminal, elongated, the bracts subpersistent at the base and apex ; calyx-lobes filiform, long-pilose, 3–4 mm. long ; corolla a little longer than the calyx ; fruits much articulated, the segments nearly separated, glabrous .. .. *picta*

U. picta *Desv.*—F.T.A. 2 : 169 ; Stapf 595 ; Holl. 2 : 206 ; Chev. Bot. 192. Commonly 1–3 ft. high, sometimes taller ; leaves sometimes variegated ; flowers small, pink or purplish, in dense villous spike-like racemes sometimes over a foot long ; fruit-segments small, pearly grey.
A common weed over Africa and the Eastern tropics ; also in Australia. (See Appendix).

82a. BUXACEAE [1]

Trees or shrubs, rarely herbs. Leaves evergreen, alternate or opposite, simple ; stipules absent. Flowers unisexual, monoecious or dioecious, spicate or fasciculate. Sepals imbricate or absent, usually 4. Petals absent. Stamens 4 or 6, rarely more ; anthers large, sessile or stalked, cells 2-valved or opening lengthwise. Rudimentary ovary sometimes present. Female flowers often larger than the males and fewer or solitary. Sepals as in the males. Ovary superior, 3-celled ; styles undivided. Ovules 1–2, pendulous, anatropous. Fruit a capsule or drupe. Seeds black, shining, with fleshy endosperm and straight embryo.

NOTOBUXUS Oliv.—F.T.A. 6, 1 : 610.

Stamens 6, two single opposite the outer sepals, four in pairs opposite the inner sepals.

A shrub or small tree, glabrous ; leaves elliptic-lanceolate or slightly obovate-elliptic, long- and gradually-acuminate to a subacute apex, cuneate at the base, 7–10 cm. long, 2·5–4 cm. broad, entire, bright green ; lateral nerves 5–7 pairs ; petiole 2–4 mm. long ; flowers axillary ; male pedicels up to 1 cm. long ; capsule ovoid, about 1 cm. long ; seeds black, shining .. .. *acuminata.*

N. acuminata *Hutch.*—F.T.A. 6, 1 : 611. *Macropodandra acuminata* Gilg—Chev. Bot. 587.
Dahomey : between Kétou and Lake Azri (Feb.). Also in N.E. Belgian Congo. Exsicc.—*Chev.* 23029.

83. SALICACEAE

Trees or shrubs. Leaves alternate, simple, deciduous ; stipules small or foliaceous. Flowers unisexual, dioecious, densely arranged in erect or pendulous catkins often appearing before the leaves ; bracts membranous, each subtending a flower. Calyx absent or represented by a cupular disk or 2 glandular scales. Male flowers : stamens 2 or more, free or united ; anthers 2-celled, opening lengthwise. Female flowers : ovary sessile or shortly stipitate, 1-celled, with 2–4 parietal placentas ; style 2–4-fid. Ovules numerous, ascending. Fruit a 2–4-valved capsule. Seeds small, with numerous fine hairs arising from the funicle and enveloping the seed ; endosperm none ; embryo straight.

Widely distributed, but absent from Australasia and the Malay Archipelago. Recognised by the minute much-reduced flowers in catkins.

[1] When compiling the key to families at the beginning of this work, we were unaware of the occurrence in our area of a representative of this interesting family. In the "Flora of Tropical Africa" *Buxaceae* were treated as a tribe of *Euphorbiaceae.*

SALIX Linn.—F.T.A. 6, 2 : 317.

Shrubs or small trees with narrow leaves ; flowers often precocious ; ovary 2-merous ; seeds covered with hairs.

Leaves acute at the apex :

Male catkins about 4 cm. long ; fruits broadly ovoid, obtuse, 5 mm. long or less ; leaves lanceolate, entire or remotely serrulate, 4–8 cm. long, 1–2 cm. broad, silky-pubescent when young, at length glabrous .. .. 1. *Ledermannii*

Male catkins about 2·5 cm. long ; fruits narrowly lanceolate, acute, about 7 mm. long ; leaves lanceolate, acutely acuminate, serrulate, 3·5–6 cm. long, up to 1·3 cm. broad, silky-pubescent when young, at length glabrous, much paler below 2. *Chevalieri*

Leaves broadly rounded at the apex, oblong-oblanceolate, entire or undulate, 2–2·5 cm. long, up to 1 cm. broad, glabrous, faintly nerved ; male catkins appearing with the leaves, terminating short lateral branchlets, up to 2·5 cm. long, loose-flowered ; stamens 5–11 ; ovary glabrous .. .. 3. *coluteoides*

FIG. 150.—SALIX LEDERMANNII *Seemen* (SALICACEAE).

A, male flower shoot. B, male flower. B_1, stamen. C, female flower shoot. D, female flower. E, longitudinal section of ovary. F, cross section of ovary showing placentation. G, fruiting branch. H, fruit. I, seed.

1. **Salix Ledermannii** *Seemen*—F.T.A. 6, 2 : 324. *S. nigerica* Skan. A riverside shrub with silky-hairy branchlets when young, becoming glabrous.
N. Nigeria : Katagum (Nov.) ! Yola (Dec.) ! Lake Chad ! Also in French Cameroons. Exsicc.—*Dalz.* 199 ; 220. *Talb.* 1493. (See Appendix).
2. **S. Chevalieri** *Seemen*—F.T.A. 6, 2 : 320 ; Chev. Bot. 611. *S. sudanica* A. Chev. A bush or shrub, sometimes attaining 30 ft., with a trunk as thick as the thigh.
French Sudan : on the Upper Niger, Ségou, Dialiba, Kénégué, Badumbé, etc. (Jan.) ! Exsicc.—*Chev.* 60 ; 262 ; 271 ; 2666. (See Appendix).
3. **S. coluteoides** *Mirb.*—F.T.A. 6, 2 : 323 ; Chev. Bot. 611. A tree or shrub, up to 12 ft., with reddish-brown glabrous branchlets.
French Sudan : Kénégué (Jan.). Senegal : Dagana, on the river bank (Oct.) ! M'bohou (Dec.) ! Kaédi to Podor, on the Senegal R. Exsicc.—*Roger. Chev.* 2667.

84. MYRICACEAE

Trees or shrubs, often aromatic. Leaves alternate, simple, sometimes pinnately lobed, scaly-glandular below, exstipulate. Flowers unisexual, monoecious or dioecious, in axillary spikes. Sepals and petals absent, or the female with a few sepal-like whorled bracteoles. Male flower subtended by a solitary bract : stamens 2 or more ; anthers 2-celled. Female flower : ovary sessile, 1-celled ;

style short, 2-branched. Ovule 1, erect, basal. Fruit a drupe, often warted, the warts waxy. Seed erect, without endosperm ; embryo straight.

A widely distributed family, often partial to damp places, numerous and variable in S. Africa. Recognised by the glandular leaves, spicate unisexual apetalous flowers and drupaceous fruit.

MYRICA Linn.—F.T.A. 6, 2 : 307.

Characters of the family :

A tree ; branchlets puberulous and glandular ; leaves oblong or oblong-lanceolate, rounded to a mucronate apex, mostly truncate and unequal-sided at the base, 5–9 cm. long, 1·3–3 cm. broad, mostly toothed, glandular on both surfaces ; lateral nerves 12–16 pairs ; flowers monoecious, male spikes axillary or sometimes race-

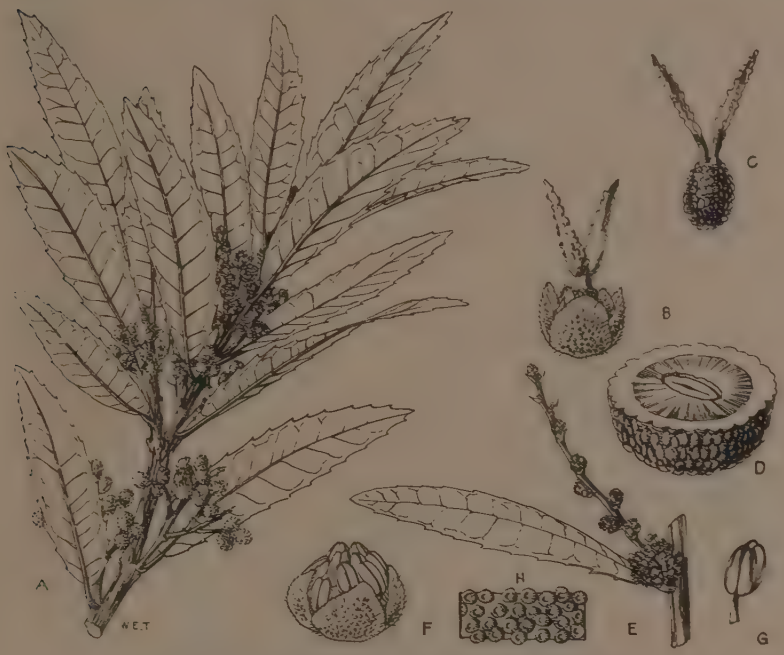

FIG. 151.—MYRICA ARBOREA *Hutch.* (MYRICACEAE).

A, female shoot. B, female flower. C, pistil. D, cross section of drupe. E, male shoot. F, male flower. G, stamen. H, glands on leaf.

mosely arranged on long leafless shoots, about twice as long as the petiole ; stamens about 6, anthers sparingly pubescent ; ovary pubescent and glandular ; fruits ellipsoid, 5 mm. long, closely warted .. .. *arborea*

M. arborea *Hutch.*—F.T.A. 6, 2 : 309. A tree reaching about 20–30 ft. in height, with rough bark. Cameroons Mt., 7,000–8,000 ft. ! Near Mann's Spring ! Above Buea ! Exsicc.—*Mann* 1203 ; 2185, *Dunlap* 185. *Dalz.* 8329.

85. ULMACEAE

With M. B. Moss.

Trees or shrubs. Leaves alternate, simple, often unequal-sided ; stipules paired, caducous. Flowers fasciculate, hermaphrodite or unisexual. Calyx herbaceous, lobes imbricate, persistent. Petals absent. Stamens inserted at the bottom of the calyx, erect in bud, opposite the calyx-lobes ; anthers 2-celled,

opening lengthwise. Ovary of 2 connate carpels, 1–2-celled ; styles 2, divergent. Ovules solitary, pendulous from near the top. Fruit usually compressed, membranous, dry or thinly fleshy, often winged or appendiculate. Seed without endosperm ; embryo straight or curved.

Mainly in the Northern Hemisphere. Flowers very small and reduced ; leaves unequal-sided ; ovary 1–2-celled, with solitary ovule.

Fruit a drupe ; flowers axillary on the current year's shoots :
Branchlets unarmed :
Cotyledons very broad ; male calyx-lobes imbricate ; leaves mostly entire **1. Celtis**
Cotyledons very narrow ; male calyx-lobes induplicate-valvate ; leaves toothed **2. Trema**
Branchlets armed with axillary spines ; leaves entire ; stipules enclosing the terminal bud, caducous .. .. **3. Chaetacme**
Fruit a rounded flat stipitate samara with broad membranous wings ; flowers in the axils of fallen leaves on previous season's growth .. .. **4. Holoptelea**

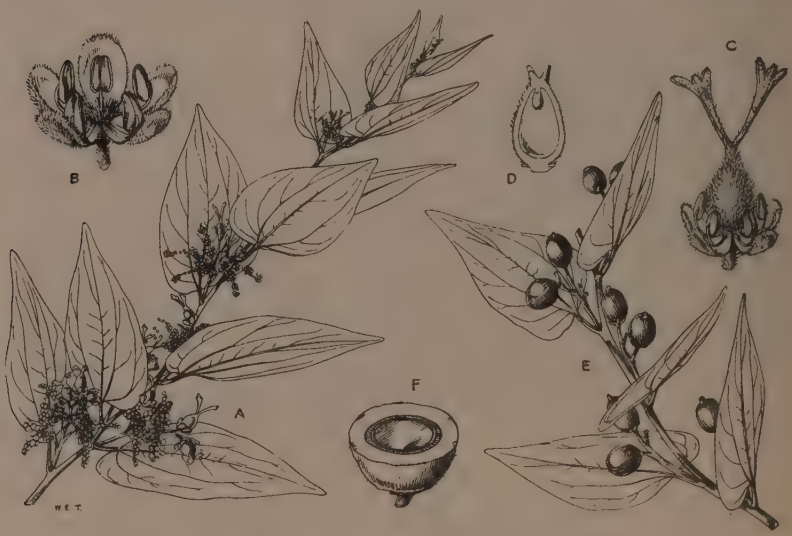

Fig. 152.—Celtis integrifolia *Lam.* (Ulmaceae).

A, flowering branch. B, male flower. C, hermaphrodite flower. D, section of ovary showing pendulous ovule. E, fruiting branch. F, cross section of fruit.

1. CELTIS Linn.—F.T.A. 6, 2 : 2.

Leaves ovate or broadly so, obliquely and broadly rounded or almost subcordate at the base, very acutely acuminate, about 4–9 cm. long, 3–5 cm. broad, entire, scabrid, prominently 3–5-nerved from the base, hairy in the axils of the main nerves below ; young shoots thinly pubescent ; male inflorescence thinly pubescent ; fruits ovoid-ellipsoid, shortly pubescent when young ; pedicels about 5 mm. long 1. *integrifolia*
Leaves more or less elliptic or obovate, usually cuneate at the base, often toothed, never scabrid and not hairy in the axils of the nerves :
Young shoots softly tomentose ; leaves elliptic or subovate, acutely acuminate, 6–10 cm. long, 3–5 cm. broad, softly pubescent below ; stipules ovate, acute, nearly 1 cm. long, pubescent ; male inflorescence softly tomentose all over ; fruits hairy when young, very shortly pedicellate, warted when old .. .. 2. *Zenkeri*
Young shoots glabrous or slightly pubescent ; leaves obovate or elliptic, more or less coarsely toothed or rarely entire :
Fruiting pedicels slender, nearly 2 cm. long, glabrous ; fruits sharply 3–4-angled, about 1 cm. long, glabrous ; leaves obovate to oblong-obovate, obtusely acuminate,

up to 12 cm. long and 8 cm. broad, mostly coarsely toothed towards the apex, closely reticulate below; upper lateral nerves 4–5 pairs .. .. 3. *Soyauxii*
Fruiting pedicels very short and stout; upper lateral nerves 2–3 pairs:
Leaves coarsely toothed in the upper half, obovate-elliptic, up to 15 cm. long and 6 cm. broad, loosely reticulate below; fruits small, ovoid, reticulate, 7–8 mm. long; ovary glabrous .. .. 4. *Prantlii*
Leaves entire, broadly elliptic, obtusely acuminate, up to 13 cm. long and 8 cm. broad, entire, 3-nerved almost to the apex, glabrous; fruits ellipsoid, about 2 cm. long, glabrous, not reticulate .. .. 5. *Adolfi-Frederici*

1. **Celtis integrifolia** *Lam.*—F.T.A. 6, 2 : 7; Holl. 4 : 613; Chev. Bot. 589, partly. A tree with scabrid leaves and small polygamous flowers.
Senegal! French Sudan: Djenne! Gold Coast: Salaga (Apr.)! N. Nigeria: Katagum! Manu (Mar.)! Agale (Jan.)! Yola (Feb.)! Gurara River! Borgu! Sokoto (Feb.)! S. Nigeria: Abeokuta! Extends to Arabia and Uganda. Exsicc.—*Roger. Dupuis. Dalz.* 13; 152; 213. *Foster* 5. *Yates* 1. *Elliott* 173. *Barter* 772. *Lely* 805. *Irving* 150. *Chev.* 1136. (See Appendix).
2. **C. Zenkeri** *Engl.*—F.T.A. 6, 2 : 6; Holl. 4 : 613. *C. rugosa* A. Chev. Bot. 589. Tree 40 ft. high; flowers green.
Ivory Coast: Kouroukoro (May)! Anoumaba (Nov.)! S. Nigeria: Aladin! Olokemeji and all over Lagos Colony (Mar.)! Extends to E. Africa and Angola. Exsicc.—*Foster* 194 *Punch* 108. *Chev.* 21788; 22393. (See Appendix).
3. **C. Soyauxii** *Engl.*—F.T.A. 6, 2 : 5; Holl. 4 : 613. *C. compressa* A. Chev. Bot. 588. A medium-sized tree with hard timber.
Ivory Coast: Bouroukrou! Gold Coast: Dunkwa (Feb.)! Obuasi (Jan.)! Prestea! Extends to E. Africa and Natal. Exsicc.—*Chev.* 16152; 22460. *Green* 902. *Soward* 664. *Vigne* 881; 951. (See Appendix).
4. **C. Prantlii** *Priemer*—F.T.A. 6, 2 : 8. *C. scotellioides* A. Chev. Bot. 590. *C. crenata* A. Chev. Bot. 588. A small tree or climber, with white flowers.
Ivory Coast: Upper Sassandra! Bouroukrou, etc.! Gold Coast: Brahabubum! Dahomey: Zagnanado! S. Nigeria: Lagos Colony! Yoruba! Fernando Po! Extends to Angola and E. Congo. Exsicc. —*Chev.* 16130; 21459; 22488; 22511. *Vigne* 919. *Barter* 3413. *Foster* 79. *Mann* 276. *Thompson* 22. (See Appendix).
5. **C. Adolfi-Frederici** *Engl.*—F.T.A. 6, 2 : 9. *C. fragifera* A. Chev. Bot. 588. Large tree 100 ft. high.
Ivory Coast: Middle Comoé! Goki Coast! Extends through French Cameroons to E. Congo and Uganda. Exsicc.—*Chev.* 22575. *Vigne* 222. (See Appendix).

2. TREMA Lour.—F.T.A. 6, 2 : 10.

Branchlets elongated, softly pubescent or tomentose: leaves distichous, ovate, caudate-acuminate, rounded or subtruncate, 6–12 cm. long, 2·5–5 cm. broad, closely serrulate, pubescent or softly tomentose; flowers polygamous, glomerate in the leaf-axils, very small; drupe subglobose, about 3 mm. long, glabrous .. *guineensis*

T. guineensis *Ficalho*—F.T.A. 6, 2 : 11; Holl. 4 : 613; Chev. Bot. 588 (as *Celtis guineensis* Schum. & Thonn.). A shrub or tree.
Common throughout tropical Africa, Natal, Madagascar and Arabia. (See Appendix).

3. CHAETACME Planch.—F.T.A. 6, 2 : 13.

Branchlets zigzag, scabrid, armed with axillary spines 1·5–2 cm. long; leaves elliptic, mucronate, rounded at the base, about 7 cm. long and 4 cm. broad, entire (serrate in the variety *crenata*), glabrous and often shining above, with about 8–10 pairs of lateral nerves; flowers monoecious, in short axillary cymes; fruits ellipsoid, about 8 mm. long, tipped by the 2 long hairy style-arms about 2 cm. long .. .. *microcarpa*

C. microcarpa *Rendle*—F.T.A. 6, 2 : 13; Chev. Bot. 590 (as *C. aristata* Planch.).
Ivory Coast: various localities! Gold Coast: Kwase! Dahomey: Zagnanado! Tropical Africa generally. Exsicc.—*Chev.* 21782. *Chipp* 575.
var. **crenata**—*C. aristata* var. *crenata* A. Chev. Bot. 590. Leaves sharply serrate; probably only sucker-shoots of the typical form.
Ivory Coast: Middle Sassandra, Orodougou! Exsicc.—*Chev.* 21824.

4. HOLOPTELEA Planch.—F.T.A. 6, 2 : 1.

Branchlets glabrous; leaves elliptic or ovate, shortly acuminate, rounded or subcordate at the base, 6–12 cm. long, 2·5–6 cm. broad, entire, glabrous; lateral nerves 5–8 pairs; petiole 1 cm. long; stipules minute; sepals and anthers puberulous; fruits broadly obovate or orbicular, rather deeply emarginate, shortly cuneate to the stipitate base, about 4 cm. diam., wings membranous, puberulous, striately marked with numerous radiating lines from the oblique fruit body .. .. *grandis*

H. grandis *Mildbr.* in Notizbl. Bot. Gart. Berlin 8 : 53. *H. integrifolia* Rendle—F.T.A. 6, 2 : 2, not of Planch. *Hymenocardia grandis* Hutch.—F.T.A. 6, 1 : 649. A large tree 80–160 ft. high.
Togo: Atem! Bagu! Njamassila! Atakgama, 1,200 ft.! Also in N.E. Congo. Exsicc.—*Doering* 347. *Kersting* 157; 301; A. 515. (See Appendix).

86. MORACEAE

Trees or shrubs or rarely herbs, often with milky juice. Leaves alternate, rarely opposite, simple; stipules paired, often caducous and leaving a scar. Flowers much reduced, often in heads, disks or hollow receptacles, unisexual.

Calyx-lobes usually 4, sometimes reduced, imbricate or valvate. Stamens usually equal in number and opposite to the sepals; filaments inflexed or erect in bud; anthers 2-celled. Female flower with superior or inferior ovary, of 2 carpels, one often abortive, usually 1-celled; styles mostly 2, filiform; ovule solitary, pendulous, rarely basal and erect. Fruit a small achene, nut or drupe. Seed with or without endosperm, often with curved embryo.

Mainly in the tropics; recognised by the prominent stipules, which leave a scar on falling, and the minute unisexual flowers often arranged on variously shaped receptacles.

Stamens reflexed in bud with reversed anthers; trees, shrubs or herbs; flowers not in a nearly closed receptacle.
Flowers in dense spicate or capitate inflorescences, the male often catkin-like:
Style divided from the base into 2 branches, terminal; leaves trinerved from the base .. .. 1. **Morus**
Style simple or with a very short branch, slightly lateral on the ovary; leaves pinnately nerved .. .. 2. **Chlorophora**
Flowers (at any rate the male) densely crowded on a flattened or concave but open receptacle; female flowers on the same receptacle or distinct and solitary:
Receptacle with several female flowers amongst the males; usually herbs; receptacles usually with several spreading linear lobes on the margin .. 3. **Dorstenia**
Receptacle with a solitary central female flower; shrubs or trees
4. **Trymatococcus**
Stamens erect in bud; anthers erect; ovule pendulous from the apex of the ovary cell:
Flowers arranged on the inside of a hollow nearly closed receptacle (fig.) with a small ostiole (mouth) at the top; peduncle with a whorl of 2–3 bracts at the top, rarely these scattered on the outside of the receptacle; stipules leaving a circular scar on the shoot .. .. 5. **Ficus**
Flowers arranged inside an open receptacle and often exserted from it:
Fruit superior, free from the receptacle; perennial subwoody herbs with simple stems; stipules small .. .. 6. **Scyphosyce**
Fruit merged with the receptacle:
Receptacles bisexual, the male flowers covering the inner face, the female solitary and sunk in the middle .. .. 7. **Bosqueia**
Receptacles unisexual; male flowers capitate, female solitary .. 8. **Antiaris**
Flowers arranged on the outside of a fleshy globose or ellipsoid receptacle; floral bracts often peltate at the apex; fruits buried in the fleshy part of the receptacle and forming a syncarp .. .. 9. **Treculia**
Stamens erect in bud; anthers erect; ovule erect from the base of the ovary cell:
Male flowers with 2–4 stamens; sepals free; style short; stigma broad, lanceolate; leaves digitately 5–7-foliolate or simple or shortly 3-lobed .. 10. **Myrianthus**
Male flowers with 1 stamen; sepals united; style long, with a brush-like stigma; leaves divided almost to the base into numerous spreading segments
11. **Musanga**

1. MORUS Linn.—F.T.A. 6, 2 : 19.

Small tree; leaves broadly elliptic, cordate, very abruptly acuminate, crenate, 7–11 cm. long, 5–7·5 cm. broad, thin; pilose in the axils of the nerves below; nerves 3 from the base, ascending and subparallel; petiole 1·5 cm. long; male inflorescences not seen; females on slender peduncles about 2 cm. long; syncarp about 1·3 cm. diam., dry; calyx-lobes very broad .. .. *mesozygia*

M. mesozygia *Stapf*—F.T.A. 6, 2 : 21; Holl. 6 : 616; Chev. Bot. 591. A small tree with reddish-brown glabrous branchlets.
Senegal: Dakar (planted). Ivory Coast: Zaranou (Mar.)! Mankono, Séguéla. Gold Coast: Odumase (Mar.)! Togo: Lome! S. Nigeria: Ogbomosho! Locality? (Jan.)! Also in French Cameroons. Exsicc. —*Thompson* 50. *Rowland.* *Dodd* 394. *Warnecke* 347. (See Appendix).

2. CHLOROPHORA Gaud.—F.T.A. 6, 2 : 21.

Leaves broadly and obliquely ovate to oblong-elliptic, very shortly acuminate, more or less cordate at the base, 8–15 cm. long, 6–8 cm. broad, undulate on the margin, with numerous oblique lateral nerves and finely reticulate; petiole 3–4 cm. long; male catkins up to 15 cm. long, shortly pedunculate; female catkins up to 5 cm. long, about 1·3 cm. diam. .. .. *excelsa*

C. excelsa *Benth. & Hook. f.*—F.T.A. 6, 2 : 22; Holl. 4 : 616; Chev. Bot. 590. *C. alba* A. Chev. and *C. regia* A. Chev. Bot. 590–1. A very large forest tree, with bole up to 80 ft. or more, shortly buttressed, smooth bark becoming brown and scaling, and whitish latex; female tree with stouter catkins and more spreading crown than the male.

From French Guinea to Cameroons, extending to Nile Land, Uganda and E. Africa, and to Belgian Congo and Angola. Exsicc.—*Barter* 3330. *Mann* 705. *Moloney*. *Johnson* 910. *Yates* 20. *Chev.* 12464 bis; 12505 bis; 17627; 17942; 23728; 24161; 24235; 24236. (See Appendix).

3. DORSTENIA Linn.—F.T.A. 6, 2 : 25; Engl. Monogr. Morac. Afr. (1898).

Receptacle at most only toothed around the margin, not extended into linear lobes :
Leaves over 15 cm. long, obovate to obovate-elliptic, rather long-acuminate, with numerous lateral nerves; stipules about 1 cm. long, subulate; receptacle broadly turbinate, about 1 cm. diam., with numerous very small teeth .. 1. *elliptica*
Leaves up to 10 cm. long, obovate-oblanceolate, obtuse or gradually acuminate, with 3–5 pairs of lateral nerves; receptacle boat-shaped, about 1·5 cm. long, sharply toothed .. .. 2. *prorepens*
Receptacle with 1 or more linear arms :
Receptacle with several (6 or more) linear arms :
Stipules filiform, 1·5 cm. long, persistent; stems glabrous; receptacle with several primary arms about 3 cm. long and shorter intermediate arms; leaves obovate-oblanceolate, gradually acuminate, narrowed to the base, 15–17 cm. long, 5–7 cm. broad, faintly denticulate, glabrous .. .. 3. *multiradiata*
Stipules much smaller; stems more or less pubescent :
Body of receptacle 3 cm. across; arms numerous, linear-filiform, up to 2·5 cm. long; leaves obovate, rather long-cuneate at the base, 12–15 cm. long, 5–6 cm. broad, glabrous; petiole 1 cm. long .. .. 4. *Barteri*
Body of receptacle 1–1·5 cm. across; arms 6–10, about 2 cm. long; leaves obovate, shortly acuminate, more or less cuneate at the base, sometimes lobulate-toothed, up to 18 cm. long and 11 cm. broad, glabrous, with about 6–8 pairs of lateral nerves .. .. 5. *Mannii*
Receptacle with few (1–5) arms :
Receptacle with 3–5 arms :
Arms of receptacle very broadly triangular at the base and forming a plate about 1·5 cm. across; arms about 3·5 cm. long; leaves obovate, bluntly acuminate, narrowly cuneate at the base, 10–14 cm. long, 4·5–5·5 cm. broad, undulate on the margin, glabrous; petiole 1–1·5 cm. long; peduncle 1·5–3 cm. long 6. *subtriangularis*
Arms of receptacle rather narrow at the base and not forming a definite plate :
Leaves 6 cm. or more long :
Arms of receptacle as long as or longer than the peduncle, about 1·5 cm. long :
Leaves oblong-oblanceolate, broadly acuminate, about 15 cm. long and 5 cm. broad, glabrous .. .. 7. *Ledermannii*
Leaves oblong-oblanceolate, triangular-acute, 8–12 cm. long, 2–4 cm. broad, thin and flaccid, puberulous on the nerves below; root tuberous 8. *gourmaensis*
Arms of receptacle shorter than the peduncle, about 1 cm. long; leaves obovate, irregularly toothed in the upper half, caudate-acuminate, 12–15 cm. long, 5–7 cm. broad, glabrous .. .. 9. *obanensis*
Leaves up to 3 cm. long, elliptic-lanceolate, obtuse; receptacle 3-armed, body narrowly triangular, 1·2 cm. long; arms filiform, 0·5 cm. long; peduncle 0·5 cm. long .. .. 10. *Preussii*
Receptacle with 1–2 arms :
Receptacle boat-shaped, with 2 equal arms about 1·5 cm. long; leaves oblong-oblanceolate, abruptly acuminate, 12–14 cm. long, 3·5–5 cm. broad, glabrous; lateral nerves 8–9 pairs, looped well within the margin .. .. 11. *Smythei*
Receptacle with only 1 long arm :
Receptacle ovate-orbicular, toothed or sublobulate, the body and plate about 2·5 cm. broad; arm linear, about 5 cm. long; leaves obovate, undulate or lobulate, acuminate, about 15 cm. long and 6 cm. broad, glabrous; stems pubescent 12. *piscaria*
Receptacle linear with a short arm at the base and a linear arm at the apex about 4 cm. long; leaves obovate or oblong, acuminate, about 15 cm. long, up to 6·5 cm. broad; stems nearly glabrous .. .. 13. *scabra*

1. **Dorstenia elliptica** *Bureau*—F.T.A. 6, 2 : 31. *D. frutescens* Engl. Monogr. Morac. Afr. 12, t. ii. B; F.T.A. 6, 2 : 30. Half-shrubby plant with slender stem pilose when young and slender horizontal rhizome.
S. Nigeria: Barombi! Johann-Albrechtshöhe. Fernando Po! Also in French Cameroons and Gabon. Exsicc.—*Mann* 64. *Preuss* 384. *Staudt* 461.
2. **D. prorepens** *Engl.*—F.T.A. 6, 2 : 45, incl. var. *robustior* Rendle; Engl. l.c. 18, t. i. A, iii. A. Stem half woody, procumbent and rooting, covered, like the petioles and peduncles, with short brown hairs.
S. Nigeria: Oban! Cameroons Mt., 3,000–5,000 ft.! Exsicc.—*Mann* 1956. *Talb.* 2316.
3. **D. multiradiata** *Engl.*—F.T.A. 6, 2 : 54; Engl. l.c. 15, tt. i. D, iii. C. Stem erect, 2 ft. or more, puberulous, often from a creeping or rooting woody base.
S. Nigeria: Barombi! Exsicc.—*Preuss* 204.
4. **D. Barteri** *Bureau*—F.T.A. 6, 2 : 53; Engl. l.c. 14. Stem erect, 2 ft. high, from a creeping rooting base, pubescent above.
S. Nigeria: Calabar! Ifunkpa-Atakom (Dec.)! Oban! Fernando Po (Jan., June)! Exsicc.—*Barter* (no number). *Mann* 152. *Talb.* 656; 672; 674.

Fig. 153.—Dorstenia Mannii *Hook. f.* (Moraceae).
A, section through receptacle. B, portion of receptacle more highly magnified. C, stamen.

5. **Dorstenia Mannii** *Hook. f.*—F.T.A. 6, 2 : 31. *D. ophiocoma* K. Schum.—Engl. l.c. 17, t. iv. C. *D. ophiocoma* var. *longipes* Engl. *D. intermedia* Engl.—Engl. l.c. 17, t. iv. D. Herb with hairy erect unbranched stem, 1–2 ft. high.
S. Nigeria : Calabar ! Oban ! Victoria ! Tiko (Feb.) ! Also in French Cameroons. Exsicc.—*Mann* 2316. *Thomson* 10. *Talb.* 673. *Schlechter* 12368. *Dunlap* 255.
6. **D. subtriangularis** *Engl.*—F.T.A. 6, 2 : 55 ; Engl. l.c. 15, t. v. A. Stem erect, 6 in. to 2 ft. high, simple or sometimes branched, shortly hairy when young, herbaceous above, woody below, sometimes from a horizontal rooting base.
S. Nigeria : Oban ! Ambas Bay (Feb.) ! Mayuku (Feb.) ! Tiko (Jan.) ! Also in French Cameroons. Exsicc.—*Mann* 14. *Dalz.* 8238. *Dunlap* 184. *Talb.* 2315.
7. **D. Ledermannii** *Engl.*—F.T.A. 6, 2 : 57. A shrub 6 ft. or more high, with slightly hairy branchlets spreading at an acute angle.
S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Talb.* 675.
8. **D. gourmaensis** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8 : 207 ; Chev. Bot. 592 (incl. var. *floribunda* A. Chev.). A fleshy herb with simple stem 6–12 in. high from a depressed-spherical tuber 1 in. or more in diam., or from several smaller superposed tubers.
French Sudan : Gourma Prov. (July) ! Exsicc.—*Chev.* 24335 ; 24390 ; 24468 ; 24528.
9. **D. obanensis** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined.
S. Nigeria : Oban ! Exsicc.—*Talb.* (no number) ; *Talb.* 628 ; 630.
10. **D. Preussii** *Schweinf.* ex *Engl.*—F.T.A. 6, 2 : 70 ; Engl. l.c. 21, t. viii. D. A small plant 4–6 in. high, slender, pubescent, erect from a horizontal rhizome, leafy at the apex.
Sierra Leone : Sugarloaf. Also in French Cameroons. Exsicc.—*Preuss.*
11. **D. Smythei** *Sprague*—F.T.A. 6, 2 : 60. *D. aspera* A. Chev. Bot. 591–2. *D. poinsettiifolia* Engl. ; Chev. Bot. 592. A shrub 6–8 ft. high, with slender branchlets pubescent when young.
Sierra Leone : Jepihun (Jan.) ! Gola Forest (Jan.) ! Ivory Coast : several localities ! Exsicc.—*Smythe* 237. *Unwin & Smythe* 52. *Chev.* 17492 ; 19200 ; 21162 ; 21197 ; 21288 ; 21303.
var. **deltoidea** *Hutch. & J. M. Dalz.* in Kew Bull. 1928. *D. aspera* var. *deltoidea* A. Chev. Leaves truncate and very abruptly acuminate at the apex.
Ivory Coast : Dyola country, Danané, by the stream Boan (Apr.) ! Exsicc.—*Chev.* 21288 bis.
12. **D. piscaria** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined.
S. Nigeria : Oban ! Exsicc.—*Talb.* (no number).
13. **D. scabra** *Engl.*—F.T.A. 6, 2 : 51. *D. scabra* var. *denticulata* Engl. Herb 3 ft. high, the young branchlets pubescent.
S. Nigeria : Akassa ! Also in French Cameroons and French and Belgian Congo. Exsicc.—*Barter* 2089.

4. TRYMATOCOCCUS Poepp. & Endl.—F.T.A. 62 : 74.

Leaves entire, obovate-elliptic, caudate-acuminate, slightly narrowed to a rounded base, up to 22 cm. long and 10 cm. broad, glabrous and conspicuously reticulate below, with numerous looped lateral nerves ; flowers monoecious, in axillary pedunculate heads, the males numerous, surrounding a solitary female ; peduncles about 1·5 cm. long, puberulous ; fruiting receptacle ellipsoid, about 1·3 cm. long .. 1. *africanus*
Leaves subtruncate and toothed at the top, caudate-acuminate, cuneate at the base, 7–9 cm. long, 2·5–4 cm. broad, glabrous, with 5–6 pairs of lateral nerves ; heads as above but peduncles up to 5 mm. long ; fruiting receptacle obovoid, about 1 cm. long 2. *kamerunianus*

1. **T. africanus** *Baill.*—F.T.A. 6, 2 : 75 ; Engl. Monogr. Morac. Afr. 28, t. xl., fig. A. A shrub 3–10 ft. high.
S. Nigeria : Oban ! Cameroons R. (Jan.) ! Johann-Albrechtshöhe ! Barombi ! Also in French Cameroons and Spanish Guinea. Exsicc.—*Mann* 723 ; 2228. *Talb.* 631 ; 2327. *Staudt* 611.
2. **T. kamerunianus** *Engl.*—F.T.A. 6, 2 : 76. *Dorstenia amoena* A. Chev. Bot. 591.
Ivory Coast : Upper Sassandra (May) ! Extends to Congo and Tanganyika Territory. Exsicc.—*Chev.* 21528.

5. FICUS Linn.—F.T.A. 6, 2 : 78. (See Appendix).

Key to the Subgenera.

Ostiole (mouth) of the receptacle with several bracts visible from the outside and spreading transversely across the orifice :
Bracts scattered on the peduncle and over the surface of the receptacle, sometimes very small
I. Sycidium
Bracts arranged in a single whorl at the base of the receptacle, none on the surface of the receptacle :
Male flowers usually with 2 stamens ; leaves often toothed and scabrid or hairy
II. Sycomorus
Male flowers with a single stamen ; leaves always entire and rarely scabrid or hairy
III. Urostigma
Ostiole (mouth) of the receptacle pore-like and more or less 2-lipped, with all the bracts descending abruptly into the receptacle and not visible from outside
IV. Bibracteatae

Subgenus I.—Sycidium Miq.

Leaves nearly all opposite, often with 3-dentate tips, lanceolate or oblong-lanceolate, 3–10 cm. long, 1·3–4 cm. broad, scabrid on both surfaces ; lateral nerves 5–6 pairs ; stipules persistent, lanceolate, 5 mm. long, ciliate ; receptacles axillary, solitary, pedunculate, subglobose, 1·3–2 cm. diam., scabrid .. .. 1. *capreaefolia*
Leaves always alternate, entire or variously toothed or lobed :
Leaves linear-lanceolate, entire, about 6 times as long as broad, 9–12 cm. long, 2–3 cm. broad, somewhat scabrid ; lateral nerves 9–10 pairs ; stipules deciduous ; receptacles axillary, subglobose, about 1·3 cm. diam., shortly setulose .. 2. *acutifolia*

Leaves ovate or elliptic, never more than 3 times as long as broad, sometimes divided :
Stems climbing or twining ; leaves rather distantly denticulate, obliquely ovate-oblong, acutely acuminate, 7–14 cm. long, 2·5–6 cm. broad, pubescent or almost tomentose with soft spreading hairs below ; lateral nerves 5–7 pairs ; stipules deciduous ; receptacles axillary, obovoid-globose, 2–2·5 cm. long, setose-pubescent 3. *pendula*

Much-branched trees or shrubs :
Leaves long-caudate-acuminate, obliquely elliptic, 10–24 cm. long, 4–8 cm. broad, almost membranous, coarsely repand-dentate, slightly scabrid below ; lateral nerves 6–7 pairs ; stipules deciduous ; receptacles solitary or 2–3 together, globose, nearly 1 cm. diam., minutely scabrid and spotted .. .. .. 4. *urceolaris*
Leaves rounded or shortly acuminate :
Large tree ; leaves usually not lobed, elliptic or obovate-elliptic, up to 14 cm. long and 10 cm. broad, finely toothed, very scabrid on both surfaces ; lateral nerves 3–5 pairs ; receptacles axillary, solitary or paired, obovoid or subglobose, 1·3 cm. diam., roughly scabrid .. .. 5. *exasperata*

Fig. 154.—Ficus exasperata *Vahl.* (Moraceae).
A, leaf-surface showing hairs. B, single hair. C, fruit. D, longitudinal section of same.

Shrub up to 3 m. high ; leaves usually lobed, variable, nearly entire and then oblong-elliptic, or pinnately 3–5-lobed and then cuneate at the base, 5–10 cm. long, 3–5 cm. broad, scabrid on both surfaces ; lateral nerves 6–8 pairs ; receptacles axillary, solitary or paired, globose, about 1 cm. diam., scabrid, ostiole prominent .. .. 6. *asperifolia*

Subgenus II.—Sycomorus Gasp.

Leaves entire or equally toothed all round the margin :
Receptacles borne in panicles on the main stem or older branches :
Stipules persistent for some time ; panicles long and slender, with short lateral branches racemosely arranged ; receptacles mostly at the base of the trunk, setose-pilose ; basal bracts 2, ovate, pilose ; leaves obovate to obovate-elliptic, shortly and subacutely acuminate, 10–20 cm. long, 4·5–12 cm. broad, coarsely undulate-dentate, long-pilose on the nerves below .. .. 7. *Vogeliana*
Stipules early deciduous ; panicles thyrsoid ; receptacles glabrous, tomentose or scaly-puberulous :
Mature receptacles softly tomentose, globose, 2–2·5 cm. diam. ; basal bracts 3, small, soon glabrous ; leaves ovate or oblong-ovate, obtuse or shortly acuminate, 6–25 cm. long, 4–12 cm. broad, coarsely and irregularly repand-dentate, 3-nerved at the base, rather densely pubescent below .. .. .. 8. *mallotocarpa*

Mature receptacles glabrous or puberulous :
Leaves suborbicular, cordate at the base, shortly acuminate, 5–15 cm. in diam., entire, slightly scabrous on both surfaces, pilose on the midrib and lateral nerves below ; receptacles pear-shaped, up to 6 cm. in diam. .. .. 9. *Mucuso*
Leaves ovate or ovate-elliptic, mostly repand-dentate, up to 25 cm. long and 12 cm. broad, glabrous or nearly so ; panicles of receptacles up to 30 cm. long ; receptacles 2·5 cm. long, glabrous .. .. 10. *capensis*
Receptacles axillary and solitary, on or towards the base of the young shoots :
Leaves very broadly ovate, mostly coarsely repand-dentate, up to 20 cm. long and 17 cm. broad, mostly glabrous ; receptacles puberulous, about 4·5 cm. diam. 11. *Vallis-Choudae*
Leaves orbicular or ovate, mostly subentire or obtusely serrate, cordate at the base, 5–15 cm. long, pilose on the nerves ; receptacles densely tomentose, about 4 cm. long .. .. 12. *gnaphalocarpa*
Leaves toothed only towards the base, the remainder of the margin quite entire or undulate, about 20 cm. long and 12 cm. broad, shortly pilose on both surfaces ; receptacles not seen .. .. 13. *senegalensis*

Subgenus III.—Urostigma Gasp.

Receptacles glabrous or very slightly and finely puberulous when mature :
Leaves lanceolate or lanceolate-elliptic, obtuse at both ends, 6–15 cm. long, 2·5–6 cm. broad, entire, glabrous ; lateral nerves 10–16 pairs ; receptacles axillary, solitary or paired, pedunculate, globose, nearly 1 cm. diam. ; basal bracts 3, ovate, ciliate 14. *verruculosa*
Leaves ovate or rhomboid-ovate or when elliptic then acuminate :
Leaves more or less caudate-acuminate :
Leaves ovate-rhomboid, more or less cuneate at the base, 6–11 cm. long, 3–6 cm. broad, glabrous and shining ; lateral nerves 9–12 pairs ; receptacles axillary, paired, sessile, globose, about 8 mm. diam. ; basal bracts broadly ovate, glabrous 15. *Lecardii*
Leaves elliptic or oblong-elliptic, rounded at the base, 12–18 cm. long, 5–8 cm. broad, finely scabrid ; receptacles axillary, solitary, pedunculate, subglobose, about 1·3 cm. diam., puberulous ; basal bracts ovate, slightly pubescent outside 16. *dicranostyla*
Leaves obtuse or slightly acuminate, ovate or oblong-ovate, deeply cordate or rounded-truncate at the base, 8–15 cm. long, 6–10 cm. broad ; receptacles axillary, mostly paired, shortly pedunculate, globose, 1 cm. diam., warted .. .. 17. *ingens*
Receptacles softly and densely tomentose when mature :
Midrib of leaf fading away and branched below the apex of the blade, the latter ovate-oblong or oblong-elliptic, slightly cordate or rounded at the base, 6–10 cm. long, 3–6 cm. broad, entire, glabrous, glaucous ; receptacles axillary, paired, pedunculate, 1 cm. diam. .. .. 18. *katagumica*
Midrib of leaf continued to the apex of the blade, the latter oblong or oblong-lanceolate, mostly truncate at the base, 8–18 cm. long, 3–8 cm. broad, the midrib pubescent above ; receptacles solitary or paired, subglobose, 1 cm. diam. .. 19. *kawuri*

Subgenus IV.—Bibracteatae Mildbr. & Burret.

Sect. I. **Axillares.** *Receptacles in the axils of the leaves of the young shoots (rarely some extending to the two-year-old wood), solitary or paired :*
*Stipules mostly large and conspicuous, persistent during the flowering and fruiting periods :
Leaves more or less pandurate, usually cordate and toothed at the base :
Leaves 13–17 cm. broad, entire, 9–10-nerved at the base ; receptacles axillary, paired, sessile, globose, about 4 cm. diam. ; basal bracts 3, appressed to receptacle 20. *lyrata*
Leaves 6–8 cm. broad, often hastate or toothed and about 5-nerved at the base ; receptacles axillary, sessile, globose, about 2 cm. diam. ; basal bracts 2, ovate, keeled, coriaceous .. .. 21. *sagittifolia*
Leaves not pandurate, neither cordate nor toothed :
Receptacles covered with large prominent warts ; leaves oblong-elliptic, long-acuminate, 15–18 cm. long, 4–6 cm. broad ; receptacles axillary, sessile, slightly depressed-globose, 1–2 cm. diam. .. .. 22. *praticola*
Receptacles not warted or only very slightly so :
Receptacles with a conspicuous beak about 5 mm. long, globose, densely hispid ; basal bracts 2, membranous ; leaves oblong-elliptic, shortly acuminate, 10–20 cm. long, 4–8 cm. broad, glabrous .. .. 23. *tessellata*
Receptacles not beaked or only slightly so :
Leaves usually well over 8 cm. long ; receptacles 1–5 cm. diam. :
Leaves very distinctly acuminate :

Leaves with 4–5 pairs of lateral nerves :
Receptacles glabrous, globose, 1·3 cm. diam. ; leaves elliptic to oblanceolate, 11–22 cm. long .. .. 24. *camptoneura*
Receptacles densely and shortly pubescent, subglobose, 2 cm. diam. ; leaves elliptic or oblong-elliptic, 10–18 cm. long .. .. 25. *camptoneuroides*
Leaves with 6–8 pairs of lateral nerves :
Leaves elongate-oblong-elliptic, long-caudate-acuminate, 18–22 cm. long, 6–7 cm. broad, glabrous ; receptacles sessile, subglobose, 1·3 cm. diam., shortly pubescent or puberulous .. .. 26. *Conraui*
Leaves obovate-elliptic, caudate-acuminate, 18–22 cm. long, glabrous ; receptacles sessile, depressed-globose, 1·5 cm. diam., strigillose .. 27. *Winkleri*
Leaves oblong or oblong-oblanceolate, shortly acuminate, 20–28 cm. long, 6–9 cm. broad, glabrous ; receptacles supra-axillary, subglobose, 5 cm. diam., glabrous .. .. 28. *Preussii*
Leaves rounded or very obtusely and shortly pointed at the apex :
Receptacles sessile, ovoid-globose, about 1 cm. diam. ; leaves oblong or oblong-oblanceolate, 5–12 cm. long, glabrous .. .. 29. *anomani*
Receptacles pedunculate, ellipsoid-obovoid, stipitate, nearly 4 cm. long ; leaves obovate or obovate-elliptic, 8–12 cm. long, glabrous .. .. 30. *Rederi*
Leaves well under 8 cm. long ; receptacles about 0·5 cm. diam. :
Leaves not acuminate ; lateral nerves 6–7 on each side (see above) 29. *anomani*
Leaves gradually obtusely acuminate ; lateral nerves about 12 on each side ; receptacles sessile, globose, 6 mm. diam., glabrous ; basal bracts 2, membranous 31. *kamerunensis*

*Stipules falling on the unfolding of the young leaves :
Leaves obtriangular, broadly truncate at the apex or retuse, with the midrib divided some distance below and not directly continued to the apex of the blade, the latter 4–8 cm. long, up to 7 cm. broad across the top ; receptacles axillary, paired, pedunculate, globose, up to 8 mm. diam. .. .. 32. *Leprieuri*
Leaves neither obtriangular nor truncate at the apex :
†Receptacles sessile :
Receptacles more or less completely invested until nearly mature by large and often calyptriform persistent basal bracts :
Leaves broadest above the middle, elongated oblanceolate-obovate, gradually attenuated to a narrow base, up to 25 cm. long and 10 cm. broad ; petioles at first shaggy-villous ; receptacles densely villous with reddish-yellow hairs 33. *eriobotryoides*
Leaves broadest about the middle, elliptic or oblong-elliptic, more or less rounded at the base :
Basal bracts coriaceous, villous ; mature receptacles glabrous or thinly pilose, up to 2·5 cm. diam. .. .. 34. *clarencensis*
Basal bracts membranous, pubescent ; mature receptacles hispid, about 4 cm. long .. .. 35. *chlamydocarpa*
Leaves broadest below the middle, ovate or ovate-orbicular :
Leaves ovate or oblong-ovate, usually much longer than broad, acuminate, 18–30 cm. long, up to 14 cm. broad ; receptacles axillary, paired, subglobose or ellipsoid, 2·5–5 cm. diam. .. .. 36. *ovata*
Leaves ovate, not acuminate, 12–24 cm. long, up to 12 cm. broad ; receptacles oblong-ellipsoid, about 3 cm. long, minutely puberulous .. .. 37. *bubu*
Receptacles not invested by the basal bracts, the latter usually small and often deciduous :
Leaves hairy below, at least on the midrib :
Leaves rounded to a broad truncate base, obovate or obovate-elliptic, 12–20 cm. long, 7–12 cm. broad, hairy only on the midrib ; receptacles depressed-globose, about 3 cm. in diam., glabrous .. .. 38. *Goliath*
Leaves cordate at the base, oblong or ovate-oblong, 5–15 cm. long, 2–7 cm. broad, shortly pubescent below, especially on the nerves ; receptacles up to 1 cm. in diam., pubescent or glabrous .. .. 39. *glumosa*
Leaves quite glabrous on both surfaces :
Leaves large, usually well over 15 cm. long and 5 cm. broad :
Receptacles about 2·5 cm. diam. ; leaves, etc., more or less as in *Vogelii* 40. *pseudovogelii*
Receptacles about 2 cm. diam., tomentellous ; leaves elliptic, slightly cordate at the base, about 17 cm. long and 6–10 cm. broad, 5-nerved at the base 41. *djalonensis*
Receptacles up to 1·3 cm. diam., usually paired, subglobose, glabrous ; leaves oblong-elliptic or elliptic, rounded or slightly cordate at the base, 11–30 cm. long, 4–12 cm. broad.. .. .. 42. *Vogelii*

Leaves mostly small, oblanceolate or obovate, usually well under 10 cm. long :
Receptacles tomentose or densely pubescent when mature, globose, 1–1·5 cm. diam. ; leaves obovate-elliptic, 5–15 cm. long, 4–7 cm. broad, glabrous ; lateral nerves 8–10 pairs .. .. 43. *basarensis*
Receptacles glabrous or nearly so :
Leaves cordate at the base, obtusely acuminate, obovate or suborbicular, 5–12 cm. long, 3–6 cm. broad, closely reticulate below ; receptacles globose, about 7 mm. diam.. .. .. 44. *leonensis*
Leaves rounded or truncate at base, acutely acuminate, 9–18 cm. long, 4·5–9 cm. broad ; lateral nerves 10–12 pairs ; young receptacles axillary 45. *aganophila*
Leaves more or less narrowed to the base, obovate to oblong-elliptic, 5–20 cm. long, 2·5–10 cm. broad ; lateral nerves 8–12 pairs ; receptacles globose, 6–8 mm. diam., puberulous or glabrous .. .. .. 46. *Thonningii*
†Receptacles pedunculate :
Leaves mostly cordate at the base, often broadly ovate or suborbicular :
Leaves acuminate, broadly ovate, 6–12 cm. long, up to 12 cm. broad, glabrous, 5–9-nerved at the base ; receptacles 2–4 together, globose, up to 1 cm. diam., glabrous or puberulous.. .. .. 47. *populifolia*
Leaves rounded or very shortly and obtusely pointed at the apex :
Receptacles prominently umbonate, in axillary fascicles, obovoid, 1·3 cm. long ; peduncles 8 mm. long ; leaves very broadly ovate or suborbicular, deeply cordate, 10–15 cm. long, 9–15 cm. broad, glabrous .. .. 48. *Kerstingii*
Receptacles slightly or not umbonate :
Peduncles 2–6 mm. long :
Leaves hairy below, broadly ovate, shortly cordate at the base, 12–20 cm. long, up to 17 cm. broad ; receptacles paired, globose, about 8 mm. diam., glabrous 49. *congensis*
Leaves glabrous below, broadly ovate or suborbicular, deeply cordate at the base, up to 20 cm. long and 17 cm. broad ; receptacles depressed-globose, up to 1·4 cm. diam. .. .. 50. *discifera*
Peduncles 1–2·5 cm. long ; leaves broadly elliptic or slightly pandurate, deeply cordate at the base, 15–26 cm. long, up to 20 cm. broad, minutely puberulous below ; receptacles about 1 cm. diam., densely pilose or glabrous and often warted.. .. .. 51. *platyphylla*
Leaves not cordate at the base, mostly broader above the middle :
Receptacles tomentose or densely pubescent when mature :
Leaves rounded at the base, oblong or oblong-elliptic, shortly acuminate, 5–7 cm. long, 2·5–4 cm. broad ; lateral nerves 9–13 pairs ; receptacles about 8 mm. diam., softly tomentose .. .. 52. *Sprague ana*
Leaves narrowed to the base, oblanceolate, 4–10 cm. long, 1·5–3 cm. broad ; lateral nerves 6–10 pairs ; receptacles 8–12 mm. diam., tomentose 53. *iteophylla*
Receptacles glabrous or very slightly pubescent when mature :
Leaves large, oblong or linear-oblong, fairly long-acuminate, up to 40 cm. long, with the lateral nerves spreading at a wide angle :
Peduncle tomentose, 3 mm. long ; leaves oblong or oblong-elliptic, 7–15 cm. long, 2·5–5 cm. broad ; receptacles subglobose, 7 mm. diam., glabrous 54. *pseudomangifera*
Peduncle glabrous, about 10 mm. long ; leaves elongate-oblong-lanceolate or sometimes almost linear, gradually acuminate ; receptacles about 12 mm. diam. .. .. 55. *Barteri*
Leaves smaller, rarely over 15 cm. long :
Lateral nerves 5–6 on each side of the midrib :
Leaves 9–15 cm. long, oblong-elliptic ; receptacles 2–2·5 cm. diam., wrinkling when dry .. .. 56. *Scott-Elliotii*
Leaves 8 cm. long or less, oblanceolate or obovate-oblanceolate ; receptacles about 1·3 cm. long, wrinkling when dry .. .. .. 57. *natalensis*
Lateral nerves 8–15 on each side of the midrib ; leaves oblanceolate or rarely obovate, narrowed to the base, up to 17 cm. long and 5 cm. broad ; receptacles globose, 6–8 mm. diam. .. .. 58. *Dekdekena*
Lateral nerves about 25 on each side of the midrib, very close together ; leaves obovate or obovate-elliptic, cuneate at the base, 12–24 cm. long, up to 10 cm. broad ; receptacles paired, about 1·3 cm. diam. .. .. 59. *elasticoides*

Sect. II. **Fasciculatae.** *Receptacles borne on short leafless arrested branchlets or in fascicles on the main trunk or branches remote from the leaves ; stipules mostly caducous :*
Leaves ovate or rounded, cordate at the base, rather large ; receptacles usually large :
Leaves very shortly and obtusely acuminate, 10–25 cm. diam. ; lateral nerves 7–9 pairs ; receptacles shortly pedunculate, broadly obovoid-globose, about 3 cm. diam., wrinkling when dry.. .. .. 60. *umbellata*

Leaves distinctly caudate and often rather acutely acuminate, ovate or ovate-oblong, 7–15 cm. long, 5–12 cm. broad ; lateral nerves about 7 pairs ; receptacles pedunculate, subglobose, about 4 cm. diam., wrinkling when dry .. .. .. 61. *polita*

Leaves elliptic, oblong or obovate, if cordate at the base then small or with parallel margins :

Receptacles large, 2·5–5 cm. diam., mostly wrinkling like a dried plum when mature :

Leaves obovate, more or less cuneate to an obtuse base, about twice as long as broad, 7–11 cm. long, 4–6 cm. broad ; lateral nerves about 11 pairs ; receptacles 4–5 in a fascicle, globose or ellipsoid-globose, 2–2·5 cm. diam., shortly pubescent .. .. ..

14. **F. verruculosa** *Warb.*—F.T.A. 6, 2 : 114 ; Holl. 4 : 633. A low shrub of marshy ground or a tree 15–25 ft. high with more or less glaucous leaves and small red figs.
N. Nigeria : Nupe ! Kontagora (Nov.) ! Extends by Ubangi-Shari to Uganda and East Africa, and south to Angola. Exsicc.—*Barter* 1317. *Dalz.* 80.

15. **F. Lecardii** *Warb.*—F.T.A. 6, 2 : 117 ; Chev. Bot. 596. A tree with shining foliage, glabrous except on the young branchlets ; on rocky hills.
French Sudan : Macina, Kanikombolé (Feb.) ! Senegal : no precise locality ! French Guinea : Dalaba Plateau. N. Nigeria : Yola (May) ! Also in N. Cameroons. Exsicc.—*Lecard* 197. *Bellamy* 467. *Dalz.* 143. *Chev.* 24830.

16. **F. dicranostyla** *Mildbr.*—F.T.A. 6, 2 : 119 ; Chev. Bot. 596. A tree up to 40 ft. or more high, glabrous except for short dense tomentum on the young branchlets.
French Sudan : Koulikoro ; Ouagadougou. Senegal : opposite Cape Verde Islands ! Ziguinchor ! French Guinea : Kankan (Mar.) ! Farana, by the Niger R. (Mar.) ! Ditinn. Sierra Leone : locality ? ! Ivory Coast : Nzi region ; Baoulé Nord, Manikro. Togo : Loso ! Atakpame ! Kirikiri ! Sokode ! Dahomey : Savalou, between Pira and Kabolé. Also in Shari Basin and Uganda. Exsicc.—*Sc. Elliot* 5351. *Chev.* 562.

17. **F. ingens** *Miq.*—F.T.A. 6, 2 : 121 ; Holl. 4 : 628. A shrub, or a tree up to 40 ft. high, with stout branchlets and smooth almost shining foliage.
French Sudan : Mossi, Linoré village. Senegal : Casamance, Manpalago ! Marsasoum. Gold Coast : locality ? ! Togo : Basari ! Tabalo ! Dahomey : Atacora Mts., Somba country, 1,400–1,500 ft. N. Nigeria : Bagegi (Mar.) ! Zaria ! S. Nigeria : Lagos (Mar.) ! Also in N. Cameroons, extending to the Red Sea, Uganda and East Africa ; also in South Africa. Exsicc.—*Evans* 3. *Lamb* 45.

18. **F. katagumica** *Hutch.*—F.T.A. 6, 2 : 122 ; Holl. 4 : 628. A shady tree more or less resembling the next species, the branchlets and figs densely pale-tomentose.
N. Nigeria : Katagum ! Exsicc.—*Dalz.* 305.

19. **F. kawuri** *Hutch.*—F.T.A. 6, 2 : 122 ; Holl. 4 : 628 ; Lely 57. A large tree 50–60 ft. high, in general characters resembling the last ; branchlets and figs pale velvety-tomentose ; figs turning red when ripe.
N. Nigeria : common ! Also in N. Cameroons. Exsicc.—*Dalz.* 910. *Foster* 12. *Lely* 828.

20. **F. lyrata** *Warb.*—F.T.A. 6, 2 : 142 ; Holl. 4 : 628 ; Chev. Bot. 601. A tree up to 40 ft. high, with glabrous stout branchlets longitudinally grooved when dry, and very large fiddle-shaped leaves.
Liberia : Gola Forest ; north bank of Lofa R. ! Ivory Coast : Middle Cavally, Keeta village (planted) ! Togo : Bismarckburg (in an avenue) ! Dahomey : ? locality ! S. Nigeria : Obu ! French Cameroons : Barombi ! Also in Gabon. Exsicc.—*Preuss* 455. *Thomas* 365.

21. **F. sagittifolia** *Warb.*—F.T.A. 6, 2 : 143 ; Chev. Bot. 602. "An epiphyte on the oil-palm," with stout glabrous branchlets and long rather narrow fiddle-shaped leaves.
French Guinea : near Layah (Jan.) ! Mamou, between Soya and Kouloundaia ; Kissi, between Koundian and Ouria. Ivory Coast : Middle Cavally, Keeta ; Tebo ; Mt. Niénokoué ; Baoulé Nord, Kodiokoffi. Togo : Lome ! Dahomey : Allada ! Zagnanado. Exsicc.—*Sc. Elliot* 4656. *Chev.* 20380.

22. **F. praticola** *Mildbr. & Hutch.*—F.T.A. 6, 2 : 145. An epiphytic shrub with rather sharply angular branchlets, glabrous.
Fernando Po : grass lands of Moka, 4,000–6,000 ft. ! Exsicc.—*Mildbr.* 7106.

23. **F. tessellata** *Warb.*—F.T.A. 6, 2 : 146 ; Chev. Bot. 600. A tree with puberulous branchlets sharply angular when dry.
French Guinea : Ditinn (Apr.) ! Sierra Leone : Sugarloaf Mt., 2,500 ft. (Dec.) ! Scarcies R., Buyabuya (Feb.) ! Ivory Coast : Morénou. Togo : Bismarckburg ! Exsicc.—*Sc. Elliot* 4030 ; 4565. *Chev.* 12989.

24. **F. camptoneura** *Mildbr.*—F.T.A. 6, 2 : 147. A tree 25 ft. high, or a climbing shrub, with nearly glabrous angular branchlets.
Cameroons Mt. : Buea ! Fernando Po ! Also in French Cameroons and Gabon. Exsicc.—*Mann* 307.

25. **F. camptoneuroides** *Hutch.*—F.T.A. 6, 2 : 148. A large epiphytic shrub or a tree up to 25 ft. high, with slender glabrous branchlets sharply ribbed when dry.
Fernando Po : north side of Pico Sta. Isabel ! Also in French Cameroons. Exsicc.—*Mildbr.* 6411.

26. **F. Conraui** *Warb.*—F.T.A. 6, 2 : 150. A shrub or tree, with obtusely angular smooth branchlets nearly covered with large persistent stipules ; leaves prominently reticulate with whitish veins below.
Sierra Leone : Njala ! S. Nigeria : Lagos Colony ! Agege ! Extends to Shari and Congo Basin. Exsicc.—*Rowland. Dalz.* 8107.

27. **F. Winkleri** *Mildbr. & Burret*—F.T.A. 6, 2 : 152. A tree with glabrous branchlets.
S. Nigeria : Victoria, forest in the Botanic Garden ! Exsicc.—*Winkler* 1204.

28. **F. Preussii** *Warb.*—F.T.A. 6, 2 : 152. Branchlets sulcate when dry, covered with greyish glabrous bark.
S. Nigeria : Barombi ! Also in French Cameroons and Belgian Congo. Exsicc.—*Preuss* 454.

29. **F. anomani** *Hutch.*—F.T.A. 6, 2 : 157 ; Holl. 4 : 618. Branchlets fairly stout, purplish when dry, glabrous, leaves thinly coriaceous, dull with indistinct nerves.
Sierra Leone : Scarcies R., Kukuna ! Ivory Coast : Middle Cavally ; Mt. Niénokoué ! Gold Coast : Sefwi ! Dunkwa district (Mar.) ! Also in French Cameroons. Exsicc.—*Sc. Elliot* 4693. *Armitage. Chipp* 151.

30. **F. Rederi** *Hutch.*—F.T.A. 6, 2 : 154. Branchlets nearly glabrous, angular when dry, leaves with close pale venation below.
Cameroons Mt. : Buea ! Also in French Cameroons. Exsicc.—*Reder* 395.

31. **F. kamerunensis** *Warb.*—F.T.A. 6, 2 : 156 ; Chev. Bot. 604. Branchlets rather slender, sulcate, thinly pubescent, with thin scaly deciduous bark ; venation of leaves distinct below.
Sierra Leone : Talla Hills, Ninia (Feb.) ! Ivory Coast : Cavally Basin, between Grabo and Tate ! Anyoma (a liane with white latex) ! Middle Sassandra, Guideko (epiphyte on oil-palm). S. Nigeria : Cross R. ! Victoria, in the Botanic Garden ! Johann-Albrechtshöhe ! Also in French Cameroons and Gabon. Exsicc.—*Sc. Elliot* 4913. *Staudt* 897.

32. **F. Leprieuri** *Miq.*—F.T.A. 6, 2 : 158 ; Holl. 4 : 628 ; Chev. Bot. 603. Commonly epiphytic and scandent, becoming a tree up to 80 ft. high, with glabrous branchlets and leaves.
Common in the coastal districts, occasionally in humid localities in the interior ! Also in French Cameroons and Belgian Congo. Exsicc.—*Barter* 2228. *Thomson* 71. *Sc. Elliot* 4286 ; 4991. *Dawodu* 251. *Whyte* 10. *Sim* 36. *Preuss* 544.

33. **F. eriobotryoides** *Kunth & Bouché.*—F.T.A. 6, 2 : 160 ; Holl. 4 : 625 ; Chev. Bot. 602. A tree 20–30 ft. high, sometimes very much larger, with leaves crowded at the ends of the yellow-shaggy branchlets.
From French Guinea to French Cameroons and French Congo ; also in East Africa. Exsicc.—*T. Vogel* 139 ; *Sc. Elliot* 5017 ; 5330a. *Cummins* 120. *Johnson* 581 ; 930.
var. **Baillei** *A. Chev.* differs from the type in the leaves being permanently and rather densely golden-pubescent on the lower surface.
French Guinea : bed of R. Ditinn ! N. Nigeria : Ankpa ! S. Nigeria : Owerri ! Also in Belgian Congo. Exsicc.—*Lamb* 21 ; 81. *Sherriff. Chev.* 12989 bis.

34. **F. clarencensis** *Mildbr. & Hutch.*—F.T.A. 6, 2 : 162. A large tree with slightly pilose stout branchlets.
Fernando Po : north side of Pico Sta. Isabel, 3,600–4,600 ft. ! Exsicc.—*Mildbr.* 6408.

35. **F. chlamydocarpa** *Mildbr. & Burret*—F.T.A. 6, 2 : 163. A tree 40–50 ft. high with a broad crown ; branchlets hirsute when young ; leaves crowded at the ends of the branchlets, 5–8 in. long, 3–3½ in. broad, dull and glabrous, with close prominent reticulation below.
S. Nigeria : Bambuto Mts. Exsicc.—*Ledermann* 1733.

36. **Ficus ovata** *Vahl*—F.T.A. 6, 2 : 164 ; Holl. 4 : 630 ; Chev. Bot. 602 ; Stapf 652, t. 265 (as *F. Johnstonii*). *F. baculensis* A. Chev. A large tree with broad crown and stout ribbed purplish branchlets and large elongate usually long-pointed leaves cordate or rounded at the base ; often epiphytic at first ; commonly planted.

Senegal to French Cameroons and Fernando Po ! extending to Angola, Nile Land and East Africa. Exsicc. —*Burton & Cameron. Sc. Elliot* 5754. *Johnston. Sim* 13 ; 17. *Dalz.* 1343. *Lamb* 19. *Warnecke* 337. *Mildbr.* 6986 ; 8145.

37. **F. bubu** *Warb.*—F.T.A. 6, 2 : 166. Branchlets very stout, nearly ½ in. thick towards the apex, glabrous.

Togo : Bismarckburg ! Also in Spanish Guinea and Lower Congo region. Exsicc.—*Buettner* 712.

38. **F. Goliath** *A. Chev.*—F.T.A. 6, 2 : 167 ; Chev. Bot. 605. A tree up to 100 ft. high, with glabrous fairly stout branchlets and large leaves, dull and glabrous except on the midrib and pilose petiole.

Ivory Coast : Dabou (Feb.) ! Morénou. Exsicc.—*Chev.* 16211.

39. **F. glumosa** *Del.*—F.T.A. 6, 2 : 171 ; Holl. 4 : 627 ; Chev. Bot. 598. A large tree with small twiggy pubescent branchlets with rather stiff half-leathery leaves, with distinct raised venation below ; figs red and succulent when ripe.

Common chiefly in savannah areas from French Sudan and Senegal to N. Cameroons ! extending to Eastern Sudan, Nile Land and Belgian Congo. Exsicc.—*Lecard* 73. *Barter* 1033 ; 1101. *Sc. Elliot* 4882. *Dalz.* 147 ; 357 ; 396.

var. **glaberrima** *Martelli. F. rubicunda* Miq. Leaves quite glabrous below when mature.

Sierra Leone : Scarcies R., Wallia (Feb.) ! Falaba, common on rocky hills (Mar.) ! Togo : Sokode ; Yerapana. N. Nigeria : Nupe ! Lokoja (Oct.) ! Abinsi ! Extends to the Red Sea, Abyssinia, Uganda and Belgian Congo. Exsicc.—*T. Vogel* 140. *Sc. Elliot* 4582 ; 5170. *Dalz.* 146 ; 779.

40. **F. pseudovogelii** *A. Chev.*—F.T.A. 6, 2 : 178. Habit and leaves as in *F. Vogelii* Miq., but the figs much larger and about 1 in. in diam.

S. Nigeria : Lagos ! Also in Gabon. Exsicc.—*Millson.*

41. **F. djalonensis** *A. Chev.* Bot. 604, name only.

French Guinea : Futa Jallon, Mamou Circle, near Soya (Jan.) ! Exsicc.—*Chev.* 20372.

42. **F. Vogelii** *Miq.*—F.T.A. 6, 2 : 179 ; Stapf 650 ; Holl. 4 : 634 ; Chev. Bot. 600. A tree 20–40 ft. high, glabrous except on the terminal buds, the branchlets covered with scaly deciduous bark ; leaves often large, long-petioled, shortly and obtusely acuminate, dull, with 5–7 prominent lateral nerves and distinct pale reticulation below.

A common tree from Senegal to French Cameroons, and in Belgian Congo. Exsicc.—*T. Vogel* 6 ; 47. *Mann* 474. *Sc. Elliot* 5299. *Moloney. Armitage. Sim* 25. *Whyte* 19. *Farmar* 56 ; 391. *Elliot* 95. *Dudgeon* 7. *Poisson* 16. *Debeaux* 138. *Kersting* A. 542.

var. **pubicarpa** *Mildbr. & Burret. F. incognita* De Wildt. Figs densely whitish pubescent.

Senegal : locality ? Gold Coast : Krepi Plains, Blengo (Jan.) ! Togo : Zomboro ! Basari. Fernando Po : Musola ! Exsicc.—*Johnson* 523. *Kersting* A. 539. *Mildbr.* 6976.

43. **F. basarensis** *Warb.*—F.T.A. 6, 2 : 181 ; Chev. Bot. 603. An epiphyte or tree up to 45 ft., with rather slender pubescent branchlets.

Senegal : Casamance ! Marsasoun. Togo : Basari, growing on an old baobab ! Dahomey : ? locality ! Also in Middle Shari. Exsicc.—*Kersting* 533. *Poisson.*

44. **F. leonensis** *Hutch.*—F.T.A. 6, 2 : 185. A shrub or small tree, with branchlets covered with thin scaly deciduous bark ; figs small, solitary, sessile in the uppermost axils.

French Guinea : Kindia, by stream banks ! Sierra Leone : Bathurst, by a stream (Feb.) ! Exsicc.—*Johnston* 88. *Pobéguin* 1282.

45. **F. aganophila** *Hutch.*—F.T.A. 6, 2 : 186. A tree 50 ft. high, with purplish grooved branchlets and glabrous leathery oblong-elliptic leaves.

S. Nigeria : Kradu Lake ! Also in Spanish Guinea. Exsicc.—*Barter* 3238.

46. **F. Thonningii** *Blume*—F.T.A. 6, 2 : 187 ; Holl. 4 : 632 ; Lely 60 ; Chev. Bot. 604. A medium-sized tree, commonly about 40 ft. high, with dark green but scarcely shining foliage and small figs mostly in pairs in the upper axils.

French Sudan : Bamako ! Upper Volta, Bobo Dioulasso ! French Guinea : Farana. Sierra Leone : Kassa, 3,500 ft. ! Gold Coast : Axim ! Krepi Plains, Blengo (Jan.) ! Togo to Nigeria, one of the most commonly planted shade trees ! Cameroons Mt. : Buea ; Musake, 6,000 ft. Fernando Po : grass land of Moka ! Amongst rocks in the crater rim. Extends to Red Sea, Abyssinia, Nile Land, Uganda, East Africa, and south to Angola. Exsicc.—*T. Vogel* 9 ; 27. *Burton & Cameron. Sc. Elliot* 5064. *Johnson* 532. *Dalz.* 309 ; 397 ; 1344. *Mildbr.* 7072. *Warnecke* 322. *Kersting* A. 541.

47. **F. populifolia** *Vahl*—F.T.A. 6, 2 : 189 ; Holl. 4 : 631 ; Chev. Bot. 597. A large tree with terete branchlets covered with glabrous yellowish bark.

Dahomey : Dassa-Zoumé and environs. N. Nigeria : Kilba country, Dua (Aug.) ! Extends through N. Cameroons and Shari to the Red Sea and Abyssinia, Nile Land and East Africa ; also in Arabia. Exsicc. —*Dalz.* 144.

48. **F. Kerstingii** *Warb.*—F.T.A. 6, 2 : 192 ; Chev. Bot. 598 (as *F. abutilifolia* Miq.). *F. bangouanensis* A. Chev.? A tree 20 ft. or more high ; branchlets stout, glabrous, with reddish bark, heart-shaped leaves often red-veined ; often on rocky hills and sometimes planted.

French Sudan : Koulikoro ! rocks of Fo ; Gourma, amongst rocks at Kodjar ; Macina. French Guinea : Konakry. Togo : Sasi-bu, near Aledyo ! Dahomey : Agouagon ; Atacora Mts., 1,000–1,900 ft. N. Nigeria : Nupe ! Yola (July) ! Exsicc.—*Barter* 452 ; 995. *Dalz.* 145.

49. **F. congensis** *Engl.*—F.T.A. 6, 2 : 195 ; Chev. Bot. 597. A large tree with ribbed puberulous branchlets with smooth broad leathery leaves.

Togo : Basari ! Ikeburg ! Tamberma ! N. Nigeria : Zaria Province, Gimi (Feb.) ! Through N. Cameroons to Eastern Sudan, and in Belgian Congo. Exsicc.—*Kersting* 336 ; 76 ; 544. *Dalz.* 349.

var. **mollis** *Hutch.*—F.T.A. 6, 2 : 196. Mature figs softly pubescent.

French Sudan : Dio, Middle Niger ! French Guinea : Nono, near Kouroussa ! N. Nigeria : Zaria Province, Gimi (Feb.) ! Extends to N. Cameroons and Shari, and in Belgian Congo. Exsicc.—*Chev.* 430. *Dalz.* 350.

50. **F. discifera** *Warb.*—F.T.A. 6, 2 : 196 ; Holl. 4 : 622. A fairly large tree with very stout glabrous branchlets, showing orbicular or horseshoe-shaped leaf-scars, and broad almost round heart-shaped leaves.

N. Nigeria : a common tree, often planted ! Extends to Nubia, Upper Nile and Uganda. Exsicc. —*Dalz.* 330.

51. **F. platyphylla** *Del.*—F.T.A. 6, 2 : 197 ; Holl. 4 : 630 ; Lely 58 ; Chev. Bot. 597. A large tree with rust-coloured bark and large scaly patches ; large broad leaves with prominent veins, often pink in colour ; often epiphytic at first.

Common from Senegal and French Sudan to N. Cameroons, and extending to the Eastern Sudan, Nile Land and Uganda. Exsicc.—*E. Vogel* 73. *Johnson* 522. *Denton. Dudgeon* 65. *Dalz.* 214.

52. **F. Sprague ana** *Mildbr. & Burret*—F.T.A. 6, 2 : 202. A tree 30–40 ft. high with shortly tomentose branchlets and comparatively small leaves ; figs small, greenish, softly tomentose, sweet and juicy when ripe.

Gambia : Macarthy Island, Georgetown (Jan.) ! N. Nigeria : Komadugu Waube, near Geidam (Dec.) ! Exsicc.—*Elliott* 133. *Dalz.* 8434.

53. **F. iteophylla** *Miq.*—F.T.A. 6, 2 : 203 ; Holl. 4 : 628 ; Lely 56 ; Chev. Bot. 605. *F. sassandrensis* A. Chev. ? A tree up to 40 ft. high with a girth of 15 ft. and smooth pale bark, often epiphytic at first, with narrow glabrous leaves and small figs crowded on the branchlets.

Senegal: Cayor! French Guinea: between Diaguissa and Boulivel. N. Nigeria: Sokoto (Dec.)! Katagum (Dec.)! common, extending through Ubangi-Shari region to Eastern Sudan. Exsicc.—*Leprieur. Dalz.* 216; 398.

54. **F. pseudomangifera** *Hutch.*—F.T.A. 6, 2: 204. A large tree with almost globose crown and branches reaching down to the ground; leaves leathery, glabrous.
Sierra Leone: Scarcies R., near Sasseni (Jan.)! Liberia: Gola! Mano River, below Jal! Also in Belgian Congo and East Africa. Exsicc.—*Sc. Elliot* 4499. *Bunting* 13.

55. **F. Barteri** *Sprague*—F.T.A. 6, 2: 205; Stapf 652; Holl. 4: 619; Chev. Bot. 599. A shrub or tree up to 25 ft., epiphytic at first; branchlets glabrous, purple, with long narrow pointed leaves, glabrous, with a prominent midrib and pale lateral nerves looping to form an intramarginal nerve.
French Guinea: Mamou. Liberia: Sino! Grand Bassa! Gold Coast: Axim. Dahomey: Tohoué village, near Porto Novo! Sagou; Zagnanado. S. Nigeria: Epe! Onitsha! Bonny! Calabar. Also in Spanish Guinea and Belgian Congo. Exsicc.—*Barter* 294; 3311. *Sim* 10. *Kalbreyer* 79.

56. **F. Scott-Elliotii** *Mildbr. & Burret*—F.T.A. 6 2: 207; Chev. Bot. 600. A tree 30–40 ft. high with glabrous grooved branchlets and dull glabrous stiffly chartaceous leaves.
Senegal: Carabane! French Guinea: between Mamou and Dalaba! Dalaba high plateau; Farana! Sierra Leone: Sasseni! Ivory Coast: Sassandra River, Soubré! Exsicc.—*Sc. Elliot* 4522.

57. **F. natalensis** *Hochst.*—F.T.A. 6, 2: 208; Holl. 4: 629. A shrub or tree up to 40 ft. high, probably sometimes epiphytic at first, with glabrous grey branchlets and comparatively small dull glabrous leaves.
Gold Coast: Kwahu (Mar.)! Aburi! Fernando Po, on the beach! Also in French Cameroons, extending to Angola, Uganda and East Africa; also in Natal. Exsicc.—*Johnson* 639. *Brown* 178. *Mann* 252.

58. **F. Dekdekena** *A. Rich.*—F.T.A. 6, 2: 211. A tree or epiphyte, with nearly glabrous branchlets and glabrous usually comparatively small leaves; figs pale in colour, generally in pairs, and numerous on the young shoots.
Gold Coast: ? locality! N. Nigeria: Yola, on rocky hills (Jan.)! Malgana (Dec.)! Also in N. Cameroons and extending to Abyssinia and the Red Sea, Uganda, Belgian Congo and Angola. Exsicc.—*E. Vogel* 54. *Evans* 4. *Dalz.* 148. *Lamb* 62.

59. **F. elasticioides** *De Wild.*—F.T.A. 6, 2: 214. A tree with thick fissured bark and glabrous many-nerved leaves; figs greenish-yellow with white spots, glabrous.
Ivory Coast: Aboisso (Apr.)! Also in S. Cameroons and Belgian Congo. Exsicc.—*Chev.* 16293.

60. **F. umbellata** *Vahl*—F.T.A. 6, 2: 124; Holl. 4: 632; Chev. Bot. 598. A tree 20–40 ft. high with stout glabrous branchlets; leaves large and broad with prominent lateral nerves bifurcating; figs in clusters on the older branches away from the leaves.
French Guinea: Kouroussa; Los Islands! Konakry! Sierra Leone: Scarcies R., Old Wallia! Ivory Coast: several localities! Gold Coast: Sefwi! Togo: Atakpame! N. Nigeria: Bida (Mar.)! Also in French Cameroons, Upper Shari, French and Belgian Congo and Angola. Exsicc.—*Sc. Elliot* 4639. *Armitage. Lamb* 34.

61. **F. polita** *Vahl*—F.T.A. 6, 2: 124; Holl. 4: 631; Lely 59; Chev. Bot. 599. A large shade tree about 50 ft. high, with rather slender almost glabrous branchlets and shining heart-shaped pointed leaves.
A common tree, often planted, from Senegal to French Cameroons, extending through Central Shari to Nile Land and East Africa and to Angola. Exsicc.—*Johnson* 549; 551. *Dalz.* 321; 568. *Preuss* 409. *Baumann* 561.

62. **F. elegans** *Miq.*—F.T.A. 6, 2: 128; Holl. 4: 625; Chev. Bot. 599. A tree about 40 ft. high with stiff minutely puberulous branchlets, glabrous but dull foliage and large pedunculate figs on the older branchlets.
Ivory Coast: in forests of Middle Sassandra and Middle Cavally. Gold Coast: Cape Coast! Krobo Plains (Jan.)! Togo: east of Nyande. S. Nigeria: Lagos and environs, common! Also in French Cameroons. Exsicc.—*T. Vogel* 25; 87. *Johnson* 559. *Millen* 23.

63. **F. Buntingii** *Hutch.*—F.T.A. 6, 2: 128. An epiphyte; stem 1 ft. in diam., with glabrous elongated ribbed branchlets; leaves shining above, with prominent midrib and nerves below and closely reticulate venation; figs very large on short leafless branchlets on the main stem.
Liberia: Mano R. in Gola Forest (Apr.)! Exsicc.—*Bunting.*

64. **F. macrosperma** *Warb.*—F.T.A. 6, 2: 130; Chev. Bot. 599. A tree 130 ft. high with stout trunk and glabrous grooved branchlets; figs large, thick and woody, borne on the trunk.
Togo: Atakpame; near Enjanu-Bena! Dahomey: Dassa-Zoumé and environs! Savalou, Pira; between Kabolé and Bassila. Also in French Cameroons and Gabon. Exsicc.—*Chev.* 23650.

65. **F. ottoniaefolia** *Miq.*—F.T.A. 6, 2: 134; Chev. Bot. 599 as *F. Buettneri* Warb. A shrub with sarmentose branches, probably epiphytic at first, or a fairly large shade tree, 30 or more ft. high, with smooth pale branchlets; leaves 3-nerved at the base; figs rather long-stalked in pairs or clusters from nodes below the leafy shoot.
French Guinea: Labé; Los Islands! Konakry! Sierra Leone: near Musaia, Falaba (Mar.)! Madina, Limba (Apr.)! Ivory Coast: Morénou; Anno. Gold Coast: Asientiem! Togo: Lome! Bismarckburg. Dahomey: Kotonu. S. Nigeria: Ebute Metta (Sept.)! Johann-Albrechtshöhe! Fernando Po (Nov.)! Also in French Cameroons and Lower Congo. Exsicc.—*T. Vogel* 176. *Mann* 431. *Sc. Elliot* 5151; 5568. *Chipp* 292. *Dalz.* 1342. *Warnecke* 324.

66. **F. maculosa** *Hutch.*—F.T.A. 6, 2: 138. A small shade tree, with rather slender glabrous branchlets and dull glabrous leaves; figs like small olives clustered on the older branches, on twisted peduncles nearly 1 in. long, with a short stalk at the base of each fig.
Togo: Sokode, Bararuoba, Tamberma village! Exsicc.—*Kersting* A. 545.

6. SCYPHOSYCE Baill.—F.T.A. 6, 2: 220.

Branchlets glabrous; leaves pandurate, broadly ovate in the upper half, gradually and obtusely pointed, abruptly narrowed to the base, 10–12 cm. long, 4–5 cm. broad, entire, glabrous; lateral nerves about 10 pairs; petiole 4–6 mm. long; stipules persistent, lanceolate, acutely acuminate, 6 mm. long, glabrous; receptacles axillary, ellipsoid-obconic, about 4 mm. long, glabrous .. .. *pandurata*

S. pandurata *Hutch.*—F.T.A. 6, 2: 221. A woody undershrub of herbaceous habit; branchlets grooved with transversely peeling bark.
S. Nigeria: Oban! Exsicc.—*Talb.* 1315; 2317.

7. BOSQUEIA Thouars—F.T.A. 6, 2: 217.

Branchlets glabrous; leaves elliptic or obovate-elliptic, shortly cuneate at the base, obtusely acuminate, 5–16 cm. long, 2·5–7·5 cm. broad, entire, shining above, pale beneath, glabrous; lateral nerves about 7 pairs; petiole 1 cm. long; receptacles axillary, pedunculate; bract at base of peduncle cupular, enclosing head of flowers when young, at length bursting on one side; peduncle 5 mm. long; female calyx

short and tubular, acutely 5-cleft at the apex; style stout, bifurcate; fruit 2 cm. long; obliquely ellipsoid, striate, glabrous .. .. *angolensis*

Bosquiea angolensis *Ficalho*—F.T.A. 6, 2 : 218. *Pontya excelsa* A. Chev. Bot. 592. A tree up to 70 ft. or more high with tall bole and smooth pale bark, exuding a coagulating latex, the branchlets showing circular leaf-scars.

French Guinea: Guerzé country, between Lola and Nzo, in forest (fr. Mar.)! Kissi, between Ouria and Doffé stream (Feb.)! Ivory Coast: Indénié, Zaranou (Mar.)! Morénou, Findimanou village (Dec.)! Bangouanou (Nov.)! Gold Coast: Adeambra (May)! Dahomey: Djougou (June)! Allada, between Koussi and Haevetgi (Feb.)! Savalou, in a patch of forest at Pira (May)! between Kabolé and Bassila (May)! S. Nigeria: Tiko (Jan.)! Extends south to Angola. Exsicc.—*Vigne* 858. *Dunlap* 247. *Chev.* 16278; 20990; 22463; 22480; 23885. (See Appendix).

8. ANTIARIS Lesch.—F.T.A. 6, 2 : 223.

Young branches densely rusty-tomentose; leaves of two kinds, those of the saplings and young shoots elliptic or obovate-elliptic, unequal-sided and subcordate at the base, acutely acuminate at the apex, 10–20 cm. long, 4–9 cm. broad, denticulate, thin, setose on both surfaces; those of young fertile shoots obovate-elliptic, unequal-sided and slightly cordate at base, 5–12 cm. long, 4–9 cm. broad, entire, scabrid; lateral nerves 6–11 pairs; stipules caducous, broadly ovate, 3–4 mm. long, tomentose; fruit drupaceous, ellipsoid, 1·5 cm. long, finely tomentellous .. .. *africana*

A. africana *Engl.*—F.T.A. 6, 2 : 223; Holl. 4 : 639; Chev. Bot. 606. *A. Kerstingii* Engl. *ex* A. Chev. Bot. 606, name only. A large tree with heavy crown and cylindrical bole attaining 70 ft. without branches and 15 ft. girth; buttresses short or none; bark grey with large white blotches.

From Senegal to Nigeria, north to Zaria and Yola, and in Fernando Po! Exsicc.—*Barter* 1102; 1129; 1674. *Moloney. Sc. Elliot* 5892. *Johnson* 460. *Punch* 111. *Dodd* 399. *Dalz.* 177. *Yates* 19, 19a, 19b. *Chev.* 16217; 16639; 22337. *Warnecke* 336. *Kersting. Mildbr.* 7331. (See Appendix).

9. TRECULIA Decne—F.T.A. 6, 2 : 225.

Male flower-heads 4–6 cm. in diam.; anthers 2–3 mm. long; fruits globose, very large, as large as to twice as big as a man's head; leaves elliptic or ovate-elliptic, shortly pointed, rounded and oblique at the base, 8–20 cm. long, 3–10 cm. broad, glabrous; lateral nerves up to 15 pairs; stamens 2–4; seeds very numerous, ellipsoid, about 1 cm. long .. .. 1. *africana*

Male flower-heads about 1 cm. diam. or less; anthers less than 1 mm. long; fruits (where known) small:

Floral bracts of the male ovoid or subclavate at the apex, without a terminal peltate appendage; male receptacles ellipsoid or obovoid, 6–12 cm. long; basal bracts ovate, acute, puberulous; stamens mostly 3; leaves oblong or oblong-elliptic, obtusely acuminate, 7–17 cm. long, 3–9 cm. broad, glabrous .. .. 2. *obovoidea*

Floral bracts of the male with a flat peltate appendage at the apex:

Leaves glabrous, oblong-elliptic to obovate, caudate-acuminate, 10–20 cm. long, 2·5–8 cm. broad; lateral nerves 6–12 pairs; petiole 6 mm. long, puberulous; male flower-heads globose, at length 6 mm. diam.; stamens 2 .. 3. *Zenkeri*

Leaves softly pubescent below, elliptic or oblong-elliptic, subcordate, caudate-acuminate, 15–20 cm. long, 8–10 cm. broad, long-acuminate; lateral nerves about 13 pairs; petiole 1 cm. long, pubescent; male heads globose, 2 cm. diam.; stamens 2 .. .. 4. *mollis*

1. **T. africana** *Decne*—F.T.A. 6, 2 : 226; Holl. 4 : 639; Chev. Bot. 607. *Ficus Whytei* Stapf 650. A large forest tree up to 80 ft. high, with bole of 20 ft. and girth of 9 ft., and glabrous dark purple branchlets; the green spherical fruits, immature and mature, up to a large size, are often abundant on the trunk and large branches.

From Senegal and French Guinea to French Cameroons, in Nigeria north to 30 miles beyond Lokoja, extending to Nile Land and East Africa and south to Angola. Exsicc.—*T. Vogel* (no number). *Barter* 432. *Mann* 773. *Sc. Elliot* 4477. *Millson. Whyte. Foster* 150. (See Appendix).

2. **T. obovoidea** *N. E. Br.*—F.T.A. 6, 2 : 228. A tree 30 ft. high with branchlets slightly pubescent when young.

S. Nigeria: Calabar (Feb.)! Oban! Johann-Albrechtshöhe! Also in French Cameroons. Exsicc.—*Mann* 2303. *Thomson* 104. *Staudt* 633; 685.

3. **T. Zenkeri** *Engl.*—F.T.A. 6, 2 : 229. A slender shrub 6–8 ft. high; young branchlets puberulous.

S. Nigeria: Oban! Also in French Cameroons. Exsicc.—*Talb.* 654; 1506.

4. **T. mollis** *Engl.*—F.T.A. 6, 2 : 229. A tree 50–70 ft. high with pubescent branchlets.

S. Nigeria: Oban! Also in French Cameroons. Exsicc.—*Talb.* 635.

10. MYRIANTHUS P. Beauv.—F.T.A. 6, 2 : 230.

Leaves digitately 5–7-foliolate:

Leaflets usually sessile or stalks up to 1 cm. long, obovate, closely serrate with numerous teeth and with numerous pairs of lateral parallel nerves, up to 50 cm. long and 20 cm. broad, closely reticulate below and puberulous between the veins; male flowers forming small catkins at the ends of the branchlets of the panicles; female heads in pairs, globose, about 3 cm. diam.; infructescence about 10 cm. diam.

1. *arboreus*

Leaflets stalked (stalks up to 3 cm. long), oblong-obovate, abruptly cuneate at the base, remotely serrulate in the upper half, with up to 12 pairs of lateral nerves, up to 30 cm. long and 10 cm. broad, pale beneath and closely reticulate; male flowers

not seen ; female heads few-flowered, on a slender stalk about 1·5 cm. long ; calyx pubescent .. .. 2. *Talbotii*

Leaflets stalked (stalks hardly 1 cm. long), rather closely denticulate nearly to the base, with about 15 pairs of lateral nerves, up to 18 cm. long and 6 cm. broad, slightly pubescent on the nerves below ; male flowers crowded in subglobose or oblong clusters arranged in loose cymes .. .. 3. *Preussii*

Leaves simple or shortly 3-lobed :

Male flowers continuous and catkin-like on the branchlets of the inflorescence ; leaves obovate-elliptic, up to 50 cm. long and 25 cm. broad, coarsely serrate and strongly nerved ; female inflorescences paired, shortly pedunculate, few-flowered 4. *serratus*

Male flowers in stalked oblong or roundish clusters on the inflorescence ; leaves as above but smaller ; female flowers not seen .. .. 5. *libericus*

1. **Myrianthus arboreus** *P. Beauv.*—F.T.A. 6, 2 : 231. *M. Talbotii* Rendle, partly ; Holl. 4 : 640 ; Chev. Bot. 608. Usually a small or medium-sized tree (sometimes large) with spreading branches from a short stem,

FIG. 155.—MYRIANTHUS SERRATUS *Benth. & Hook. f.* (MORACEAE).

A, male shoot. B, male flower. C, D, stamen back and front. E, female flowers. F, section through ovary showing orthotropous ovule. G, fruits. H, cross section through fruit.

large digitately divided leaves pale cobwebby below, yellowish flowers and rough somewhat pear-shaped compound fruit, yellow when ripe.

Usually in damp places in forest from Sierra Leone to French Cameroons, Uganda and E. Africa, and south to Angola. Exsicc.—*Barter* 1677 ; 3407. *Mann* 716. *Moloney*. *Millen* 117. *Cummins* 7. *Brown* 939. *Unwin* 40. *Yates* 34. *Le Testu* 240. (See Appendix).

2. **M. Talbotii** *Rendle*—F.T.A. 6, 2 :238, partly. A shrub or tree, the leaf-bearing twigs hollow cylindrical ; fruits 4–10, beaked, united in a head 1½–2 in. diam. on a stout stalk.

S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Talb.* 624 ; 635.

3. **M. Preussii** *Engl.*—F.T.A. 6, 2 : 234. *M. gracilis* Engl.—F.T.A. 6, 2 : 233. A shrub about 5 ft. high.

S. Nigeria : Barombi (Sept.) ! Exsicc.—*Preuss* 478.

4. **M. serratus** *Benth. & Hook. f.*—F.T.A. 6, 2 : 235 ; Chev. Bot. 608. Usually a small or medium-sized tree (sometimes up to 60 ft. high) with erect cylindrical trunk, by streams in forest, often with adventitious roots ; branchlets becoming hollow, bearing ring-shaped stipular scars ; leaves serrate, silvery below ; inflorescence yellowish, fruits mulberry-like.

From French Guinea to Nigeria, Calabar River ! Exsicc.—*Heudelot* 840. *T. Vogel* (no number). *Barter* 1100. *Mann* 2273. *Sc. Elliot* 4439 ; 4560 ; 5059 ; 5881. *Poběguin* 687. (See Appendix).

5. **M. libericus** *Rendle*—F.T.A. 6, 2 : 236. A shrub, the branchlets, petioles and inflorescence brownish-pubescent.

Sierra Leone : ? locality ! Liberia : Sino Basin ! Mount Barclay ! Exsicc.—*Unwin & Smythe* 2. *Whyte*. *Bunting*.

11. MUSANGA R. Br.—F.T.A. 6, 2 : 238.

Leaves divided almost to the base into numerous spreading segments ; segments entire, narrow, shortly acuminate, up to 45 cm. long and 10 cm. broad, covered with greyish indumentum below ; lateral nerves numerous, very conspicuous below ; stipules

FIG. 156.—MUSANGA SMITHII *R.Br.* (MORACEAE).

A, male shoot. B, head of male flowers. C, male flower. D, female shoot. E, portion of female receptacle. F, section of female flower. G, fruit. H, section of same.

large, connate, 15–20 cm. long, densely pubescent ; male flowers in numerous small round heads about 4 mm. in diam. ; female inflorescence about 2 cm. long on a peduncle up to 12 cm. long, in fruit yellowish green and succulent .. *Smithii*

M. Smithii *R. Br.*—F.T.A. 6, 2 : 239 ; Holl. 4 : 641 ; Chev. Bot. 608. A quick-growing soft-wooded tree with straight stem often 20–30 ft. high, with an umbrella-like crown and prop-roots, or sometimes much larger and with a girth of 5 ft. ; branchlets very stout and pithy ; the large stipular sheaths enclosing the bud and inflorescence wine-red hairy, densely silky inside, deciduous.

Often gregarious in forest clearings, common from Sierra Leone to French Cameroons, and extending to Uganda, Belgian Congo and Angola. Exsicc.—*Barter* 2067. *Mann* 44 ; 45. *Burton & Cameron*. *Cummins* 108. *Baumann* 200. (See Appendix).

87. URTICACEAE

Herbs, undershrubs, or rarely soft-wooded trees, rarely climbing, often armed with stinging hairs ; epidermal cells mostly with prominent cystoliths ; stems often fibrous. Leaves alternate or opposite, simple ; stipules present or absent. Flowers very small, unisexual, usually cymose, sometimes crowded on a common enlarged receptacle. Male flowers with a 4–5-lobed calyx, lobes imbricate or valvate. Petals absent. Stamens as many as and opposite the calyx-lobes ; filaments inflexed in bud ; anthers 2-celled. Rudimentary ovary usually present. Female calyx like that of the male, often enlarged in fruit. Staminodes scale-like or absent. Ovary free or adnate to the calyx, 1-celled ; style simple ; ovule solitary, erect. Fruit a dry achene or fleshy drupe. Seed mostly with endosperm and a straight embryo.

A cosmopolitan family, often troublesome weeds ; stems often fibrous ; many have conspicuous rod-like or dotted cystoliths in the leaves and frequently stinging hairs ; flowers minute, apetalous.

Leaves alternate :
  Leaves stipulate, stipules intrapetiolar :
    Leaves petiolate, usually more or less equal-sided :
      Cystoliths linear :
        Perennial herbs or shrubs :
          Female calyx 4-lobed, fleshy in fruit ; leaves not lobed .. .. **1. Urera**
          Female calyx 2-lobed ; lobes very unequal, the larger one spathe-like ; leaves lobed to below the middle .. .. **2. Girardinia**
        Annuals ; female calyx 4-lobed .. .. **3. Fleurya**
      Cystoliths dot-like :
        Leaves coarsely toothed .. .. **4. Laportea**
        Leaves entire .. .. **5. Pouzolzia**
    Leaves sessile or subsessile, oblique and very unequal-sided at the base :
      Flowers within an involucre of bracts .. .. **6. Elatostema**
      Flowers in a globose or subglobose receptacle .. .. **7. Procris**
    Leaves exstipulate, with dot-like cystoliths .. .. .. **8. Parietaria**
Leaves opposite, sometimes unequal-sized in each pair, petiolate :
  Stipules free or connate only at the base ; cystoliths dot-like .. **9. Boehmeria**
  Stipules connate into one ; cystoliths linear :
    Flowers in paniculate clusters or heads .. .. **10. Pilea**
    Flowers sessile on a disk-like receptacle .. .. **11. Lecanthus**

1. URERA Gaud.—F.T.A. 6, 2 253.

Stems very short and procumbent, rooting at the nodes ; leaves deeply cordate at the base, suborbicular, shortly acuminate, about 10 cm. diam., with 4–5 pairs of lateral nerves, with fine cystoliths on the nerves but otherwise glabrous ; petioles very long ; male flowers corymbose on a long slender peduncle ; ultimate branches subumbellate ; buds glabrous ; sepals 5 ; female flowers not known .. .. .. **1.** *repens*
Stems not procumbent :
  Leaves appreciably cordate or very broadly rounded at the base :
    Leaves very distinctly toothed or rather deeply cordate :
      Leaves over 15 cm. long and nearly as much broad, abruptly acuminate, very slightly pubescent below, widely and rather deeply cordate, slightly crenate ; stems coarsely warted ; male flowers very small, crowded in panicles **2.** *cordifolia*
      Leaves shortly and closely cordate, less than 15 cm. long and under 10 cm. broad, crenate-dentate, rather gradually acuminate, nearly glabrous below ; stems more or less smooth ; panicles much shorter than the leaves .. .. **3.** *Mannii*

Leaves entire or nearly so :
Leaves shortly cordate at the base, 10–12 cm. long, 5–8 cm. broad, shortly acuminate, with very prominent cystoliths on the veins below ; stems smooth or nearly so ; panicle very short and dense .. .. 4. *Batesii*
Leaves broadly rounded at the base, broadly elliptic, shortly and abruptly acuminate, about 15 cm. long and 8 cm. broad, with 4 pairs of lateral nerves ; panicle large and lax ; pedicels filiform, fascicled .. .. 5. *Talbotii*
Leaves at most rounded but hardly cordate at the base :
Leaves very distinctly toothed :
Leaves obovate, narrowed from above the middle :
Branches rather densely setose ; leaves about 10 cm. long and 6 cm. broad, abruptly acuminate, crenate, prominently 3-nerved at the base, with numerous linear cystoliths on the veins below ; panicles short, divaricate .. .. 6. *obovata*
Branches nearly smooth, stout ; leaves broadly obovate-cuneate, shortly acuminate, 15–18 cm. long and about 10 cm. broad, denticulate, 3-nerved at the base, without visible cystoliths below ; panicles short and dense .. 7. *cuneata*
Leaves ovate or broadly elliptic, not or scarcely narrowed to the base, triangular-acuminate, 15–25 cm. long, up to 14 cm. broad, with numerous very shortly linear cystoliths below giving a slightly puberulous appearance ; panicles rather lax, divaricately branched ; stems more or less setose .. .. .. 8. *Elliotii*
Leaves entire or very minutely serrulate :
Leaves minutely serrulate, oblong-elliptic, with an oblique acumen, rounded at the base, 6–8 cm. long, 3–5 cm. broad, with linear cystoliths on the veins below ; petioles sometimes as long as the blade ; panicles pedunculate, much shorter than the leaves .. .. 9. *oblongifolia*
Leaves entire, elliptic, caudate-acuminate, slightly cuneate at the base, up to 16 cm. long and 8 cm. broad, with numerous conspicuous linear cystoliths on the veins beneath, the basal pairs of nerves ascending beyond the middle of the blade ; petiole stout, ¼–½ as long as the blade ; panicles axillary, small and rather few-flowered .. .. 10. *cameroonensis*

1. **Urera repens** *Rendle*—F.T.A. 6, 2 : 264. A low glabrous creeping herb with thin woody stem ; leaves often red-veined.
Fernando Po ! Also in S. Cameroons. Exsicc.—*Mann* 1424.
2. **U. cordifolia** *Engl.*—F.T.A. 6, 2 : 260. A half-woody climber with purplish branches armed with short stout 2–3-forked spines tipped by stinging hairs.
S. Nigeria : Johann-Albrechtshöhe ! Also in French Cameroons. Exsicc.—*Staudt* 892.
3. **U. Mannii** *Benth. & Hook. f.*—F.T.A. 6, 2 : 260, incl. var. *paurinervis* Rendle. A shrubby climber with unarmed reddish-green branches and harsh leaves with stinging hairs.
S. Nigeria : Lagos (Apr.) ! Cameroons Mt., Buea ! Fernando Po (Jan.) ! Exsicc.—*Mann* 176. *Dalz.* 1021. *Preuss* 909. (See Appendix).
4. **U. Batesii** *Rendle*—F.T.A. 6, 2 : 259. A trailing or climbing shrub with purplish unarmed glabrous stem with rootlets.
Fernando Po, 1,300 ft. ! Also in French Cameroons. Exsicc.—*Mann* 305.
5. **U. Talbotii** *Rendle* in Journ. Bot. 1916 : 369. " Berries scarlet."
S. Nigeria : Oban ! Exsicc.—*Talb.* 618 ; 1502.
6. **U. obovata** *Benth.*—F.T.A. 6, 2 : 257 ; Holl. 4 : 646 ; Chev. Bot. 610. *U. robusta* A. Chev. A climbing shrub, the young branches beset with simple or forked protuberances tipped by stinging hairs, which also are present on the leaves and inflorescence ; fruit small, fleshy, orange-red.
Sierra Leone : Freetown (June) ! Kambui ! Ivory Coast : various localities ! S. Nigeria : Olokemeji. Exsicc.—*T. Vogel* 64. *Lane-Poole* 221. *Chev.* 21539. (See Appendix).
7. **U. cuneata** *Rendle*—F.T.A. 6, 2 : 261 ; Stapf 654 (as *U. obovata*). Stem thick with few simple protuberances tipped by stinging hairs ; inflorescence reddish.
Liberia : Sino Basin ! Gold Coast : Tanosu (Dec.) ! Exsicc.—*Whyte. Chipp* 32.
8. **U. Elliotii** *Rendle*—F.T.A. 6, 2 : 258. A climber with stout rather soft stems sparsely armed with slender protuberances tipped with stinging hairs, found also on the petioles and main nerves of the leaves ; fruit yellow, succulent.
Sierra Leone : Limba, Bafodeya (Apr.) ! Balumba (Sept.) ! S. Nigeria : Lagos Colony ! Abeokuta ! Also in French Cameroons. Exsicc.—*Sc. Elliot* 5559. *Rowland. Millen* 147. *Thomas* 1920.
9. **U. oblongifolia** *Benth.*—F.T.A. 6, 2 : 255. *U. sarmentosa* A. Chev. A glabrous shrub climbing by adventitious roots on the slender stems ; branches reddish, unarmed ; fruit succulent, orange-red.
Sierra Leone : Freetown (May, June) ! Liberia : Mount Barclay. Ivory Coast : Upper Sassandra, Dyola country (May) ! Exsicc.—*T. Vogel* 73 ; 74 ; 114. *Barter* (no number). *Chev.* 21456 and 21530 (Bot. 610).
10. **U. cameroonensis** *Wedd.*—F.T.A. 6, 2 : 261. *U. Thonneri* Rendle—F.T.A. 6, 2 : 256, partly ; ? of De Wild. & Durand. A lofty climber with glabrous half-succulent stems having adventitious roots.
S. Nigeria : Oban ; Ekot. Cameroons Mt., 5,000 ft. (Dec.) ! Buea. Fernando Po (Jan.) ! Also in French Cameroons, St. Thomas and Princes Islands, and extending to Angola and Uganda. Exsicc.—*Mann* 240 ; 2173.

2. GIRARDINIA Gaud.—F.T.A. 6, 2 : 265.

Stems and petioles bristly with reflexed setose hairs ; leaves alternate, usually pinnately or subdigitately lobed to below the middle, up to 20 cm. long and broad, spreadingly pilose below and setose on the nerves, lobes very coarsely serrate, acuminate ; stipules connate, about 2 cm. long, soon falling off ; male inflorescence axillary, often branched, small, branches spike-like ; calyx sparingly setose ; female inflorescence short, dense, densely setose all over ; fruits warted .. .. *condensata*

G. **condensata** *Wedd.*—F.T.A. 6, 2 : 266. *Fleurya cannabina* A. Chev. *Urera cannabina* A. Chev. Bot. 609. An erect half-succulent-stemmed herb, 1½–6 ft. high, with stiff stinging hairs on stem, leaves and inflorescence.

French Guinea: Futa Jallon, between Dalaba and Diaguissa, 2,000–4,000 ft. (Sept.)! Diaguissa-Boulivel (Sept.)! Ivory Coast: Upper Sassandra, Gouekouma (May)! S. Nigeria: ? locality (fr. Feb.)! Throughout tropical Africa. Exsicc.—*Thompson* 514. *Cher.* 18569; 18598; 21654

3. FLEURYA Gaud.—F.T.A. 6, 2 : 245.

Male inflorescence spike-like or catkin-like, unbranched, the flowers in dense clusters; leaves ovate, more or less rounded at the base, up to about 10 cm. long and 8 cm. broad, coarsely dentate, with short linear cystoliths on the lower surface; petiole ⅓ to ½ as long as the blade; peduncles tomentose; sepals pubescent in the upper part; female inflorescence much smaller than the male, loosely few-flowered; fruits compressed, ovate, 5 mm. long, slightly rugose .. .. 1. *podocarpa*

Inflorescence paniculate:

Inflorescence longer than the leaves, large and many-flowered, bisexual; stems more or less pilose; leaves very broadly ovate, long-petiolate, acuminate, rounded or subcordate at the base, up to 15 cm. long and broad, very coarsely serrate, thinly pilose below; fruits very small, ovoid, nearly smooth .. .. .. 2. *aestuans*

FIG. 157.—FLEURYA AESTUANS *Gaud.* (URTICACEAE).
A, part of inflorescence. B, male flower. C, female flower. D, fruit.

Inflorescence about as long as the petiole, small and few-flowered, unisexual; stems hispid; leaves ovate, acuminate, slightly cordate at the base, acutely dentate, about 9 cm. long and 5 cm. broad, setulose-pubescent on both surfaces; females not seen 3. *urticoides*

1. **F. podocarpa** *Wedd.*—F.T.A. 6, 2 : 251 (incl. var. *Mannii* Wedd.); Stapf 652; Chev. Bot. 609. *Urera spicata* A. Chev. Bot. 610. A creeping herb or sometimes half shrubby, with nettle-like leaves, usually beset with stinging hairs; male inflorescence greenish-white on long naked peduncles, often directly from the underground stem.
Liberia: Cape Palmas! Gold Coast: Kumasi! Togo: Lome! S. Nigeria: Angiama! Nun R. (Sept.)! Obu! Aguku! Oban; Calabar. Cameroons Mt., 2,500 ft.! Victoria (Feb.)! Fernando Po. 1,000 ft.! All over tropical Africa. Exsicc.—*Ansell. Barter* 92. *Mann* 313; 476; 1950. *Cummins* 173; 232. *Warnecke* 438.
2. **F. aestuans** *Gaud.*—F.T.A. 6, 2 : 246; Stapf 652; Chev. Bot. 609. A herb resembling a nettle, up to 4 ft. or more high, with panicles of small green or greenish-red flowers.
All over tropical Africa, in waste places, etc.! Exsicc.—*P. Vogel* 176; 193. *Barter* (no number). *Mann* 154. *Sc. Elliot* 5507. *Millen* 130. *Brown* 413. *Whyte. Pobéguin* 303. *Warnecke* 206.
3. **F. urticoides** *Engl.*—F.T.A. 6, 2 : 247. A herb like the last but with leaves more shortly stalked and much smaller inflorescences.
Cameroons Mt.: Buea, and up to 8,000 ft. (May, June)! Exsicc.—*Preuss* 916.

4. LAPORTEA Gaud.—F.T.A. 6, 2 : 252.

Stems covered with sharp reflexed stinging bristles; leaves ovate-elliptic, acuminate, rounded at the base, 10–15 cm. long, 5–7 cm. broad, setose and pubescent on the nerves below and with dot-like cystoliths on the surface, coarsely dentate-serrate; petiole ¼ as long as the blade, setose; male inflorescences axillary, about as long as

the petiole, female much longer than the leaves and subsecund ; calyx glabrous ; fruits flat, obliquely ovate, with a thick margin and slightly rugose surface
alatipes

Laportea alatipes *Hook. f.*—F.T.A. 6, 2 : 252. *Girardinia marginata* Engl. A herb 3 ft. high.
Cameroons Mt., 7,000 ft. (Nov.) ! Common above Buea (May). Also in Uganda and East Africa. Exsicc. —*Mann* 1973. *Preuss* 618.

5. POUZOLZIA Gaud.—F.T.A. 6, 2 : 286.

Stems erect, leafy ; leaves ovate-elliptic, rather broadly acuminate, cuneate at the base, 5–10 cm. long, 1·5–4·5 cm. broad, entire, sometimes thinly woolly below, at length with conspicuous dotted cystoliths above ; petiole slender, up to 2 cm. long ; flowers clustered, sessile or subsessile, pubescent ; fruits subtended by a bract
guineensis

P. guineensis *Benth.*—F.T.A. 6, 2 : 287. Erect or half-trailing herb, slightly pubescent, more or less woody at the base : in waste places, etc.
French Guinea : Rio Nunez. Sierra Leone : Kambia ! Njala (Sept.) ! N. Nigeria : Lokoja ! Patti Ravines (Nov.) ! S. Nigeria : Lagos ! Ibadan (Aug.) ! Oban ! Fernando Po (Oct., Dec.) ! extending to Ubangi-Shari, Belgian Congo, Angola, and in St. Thomas Island. Exsicc.—*T. Vogel* 28 ; 251 ; 299. *Barter* (no number). *Sc. Elliot* 4354.

6. ELATOSTEMA Forst.—F.T.A. 6, 2 : 277.

Male inflorescence on a slender peduncle 1·5–2 cm. long ; leaves obliquely oblanceolate, acuminate, 4–10 cm. long, 2–3 cm. broad, very coarsely crenate-serrate, with about 8–10 teeth on each margin, with conspicuous cystoliths on each side ; stipules lanceolate, tailed-acuminate ; bracts broadly ovate, acute, about 3 mm. long
1. *Mannii*

Male inflorescence sessile or nearly so :
Leaves closely serrate, with about 20 or more teeth on each margin, obliquely elongate-elliptic and gradually long-acuminate, 12–15 cm. long, 2·5–6 cm. broad, with very numerous and conspicuous cystoliths on the upper surface ; male inflorescence flat and subtriangular, pubescent .. .. 2. *Welwitschii*
Leaves laxly and coarsely dentate, with 8–16 teeth on each margin :
Leaves acutely fairly long-acuminate, obliquely obovate, very unequal-sided at the base, 6–15 cm. long, up to 5 cm. broad, with very conspicuous cystoliths on the upper surface and about 12–16 teeth on each side ; bracts broadly ovate, acuminate
3. *Paivaeanum*
Leaves not acuminate, narrowly obovate, up to 3·5 cm. long and 1·5 cm. broad, with scattered conspicuous cystoliths on each surface and about 8–10 teeth on each side ; bracts rather small, shortly acuminate .. .. 4. *monticola*

1. **Elatostema Mannii** *Wedd.*—F.T.A. 6, 2 : 282. A herb with stems erect from a decumbent base sending out suckers, half succulent, 6–12 in. high ; leaves crowded on the upper part of the stem.
S. Nigeria : Johann-Albrechtshöhe ! Fernando Po ! Also in French Cameroons. Exsicc.—*Mann* 1431 ; *Staudt* 647.
2. **E. Welwitschii** *Engl.*—F.T.A. 6, 2 : 278 (incl. var. *cameroonense* Rendle). Herb with erect stem from a creeping rooting rhizome, up to 15 in. high, leafy in the upper part.
S. Nigeria : Johann-Albrechtshöhe ! Buea. Fernando Po : Clarence Peak, 4,000 ft. (Dec.) ! Also in St. Thomas Island and Angola. Exsicc.—*Mann* 632. *Staudt* 839.
3. **E. Paivaeanum** *Wedd.*—F.T.A. 6, 2 : 279. Herb with the habit of the preceding.
French Guinea : Futa Jallon, Dalaba-Diaguissa Plateau (Oct.) ! Gold Coast : Kibbi, Akim Hills (Dec.) ! Cameroons Mt. : below Buea, in plantations (Feb.) ! West of Buea in forest. Fernando Po : Clarence Peak, 4,000 ft. (Dec.) ! Also in French Cameroons. Exsicc.—*Mann* 290 ; 631. *Johnson* 254. *Dalz.* 8206. *Chev.* 18744.
4. **E. monticola** *Hook. f.*—F.T.A. 6, 2 : 281. A small herb with slender stems 1 ft. high, from a creeping rooting base.
Cameroons Mt., 7,000 ft. (Dec.) ! Above Buea. Exsicc.—*Mann* 2014.

7. PROCRIS Juss.—F.T.A. 6, 2 : 283.

Epiphytic or on rocks ; stems erect, the lower parts underground and bearing flower-heads ; leaves alternate, subsessile, obliquely oblanceolate, broadly acuminate, gradually narrowed to the base, up to 15 cm. long and 3 cm. broad, very remotely serrate, without obvious cystoliths ; flower-heads numerous and scattered on the stem from the base upwards, very shortly pedunculate ; fruits fusiform, 1·25 mm. long .. ..

P. laevigata *Blume* Bijdr. 508—F.T.A. 6, 2 : 283 (as *P. Wightiana* Wall. An epiphyte with glabrous succulent stems up to 18 in. high and ½–1 in. thick in the lower part.
Cameroons Mt., Buea. Fernando Po, 1,000–2,000 ft. (Nov.) ! Also in French Cameroons, Princes Island, Angola, Uganda and E. Africa ; also in the Mascarene Islands, India and Malaya. Exsicc.—*Mann* 566.

8. PARIETARIA Linn.—F.T.A. 6, 2 : 296.

Tall slender herb up to 3 m. high ; stems angular, soon becoming glabrous ; leaves alternate or subopposite (or rarely quite opposite), ovate, long- and acutely acuminate, rounded or subcordate at the base, 3–8 cm. long, 1·5–4 cm. broad, glabrous but with

prominent dot-like cystoliths on both surfaces; petioles ⅓-½ as long as the blade; flowers in very small axillary clustered cymes; fruit ovate, apiculate 1. *laxiflora*

Weak more or less decumbent herb with very thin stems; leaves broadly ovate, at most obtusely pointed, rounded at the base, 1–2 cm. long and broad, very thin and flaccid, covered with conspicuous dot-like cystoliths; flowers few in sessile axillary clusters or subsolitary; fruit not apiculate .. .. 2. *debilis*

1. **P. laxiflora** *Engl.*—F.T.A. 6, 2 : 296. A scandent half-woody plant with slender leafy branchlets.
Cameroons Mt., 6,000–8,000 ft. (Dec., Feb.)! Fernando Po: Clarence Peak, 8,000 ft. (Dec.)! Also on Ruwenzori. Exsicc. *Mann* 613; 1230; 2013. *Johnston* 60. *Dunlap* 42; 73.
2. **P. debilis** *Forst.*—F.T.A. 6, 2 : 298. A slender more or less branched herb from a few inches to 1 ft. high.
Cameroons Mt.! Also in Nubia, Abyssinia and Eritrea; widely spread in temperate regions and in tropical highlands. Exsicc.—*Mann* (no number).

9. BOEHMERIA Jacq.—F.T.A. 6, 2 : 284.

Leaves opposite, very broadly ovate or ovate-rhomboid, rounded at the base, rather abruptly acuminate, 7–20 cm. long and up to 18 cm. broad, thin, very coarsely triangular-dentate, rather long-petiolate, with inconspicuous dot-like cystoliths; stipules ovate-lanceolate, about 4 mm. long; spikes very slender, sometimes clustered, the clusters of flowers widely separated on the rhachis .. .. *platyphylla*

Leaves elliptic-lanceolate, gradually acuminate, rather narrow at the base, and shortly petiolate, 10–15 cm. long and about 5 cm. broad, slightly setulose on both surfaces and with inconspicuous dot-like cystoliths; spikes stouter than above, with the floral clusters more crowded .. .. *platyphylla* var. *nigeriana*

B. platyphylla *Don*—F.T.A. 6, 2 : 285. A shrub 3–15 or more ft. high, with soft-wooded branches, glabrous or slightly strigose-pubescent.
Sierra Leone: ? locality! S. Nigeria: Oban! Cameroons Mt., 7,000 ft. (Jan.)! Fernando Po (Jan.)! Widely spread in the tropics and very variable. Exsicc.—*Mann* 209. *Smythe* 102.
var. **nigeriana** *Wedd.*—F.T.A. 6, 2 : 286. Branches, petioles and inflorescence hairy.
S. Nigeria: Abo! Also in French Cameroons and East Africa.

10. PILEA Lindl.—F.T.A. 6, 2 : 267.

Flowers in small pedunculate lax cymes or stalked clusters; petiole nearly as long as the blade, slender; leaves ovate, broadly cuneate at the base, acuminate, 3–5 cm. long, 2–3 cm. broad, thin, crenate, closely covered with cystoliths on both surfaces; stipules deciduous .. .. 1. *sublucens*

Flowers clustered at the nodes or in a terminal dense cyme:

Flowers forming a whorl-like sessile cluster at the nodes:

Leaves 4–6 cm. long, 3–5 cm. broad, distinctly acuminate, rhomboid-ovate, broadly cuneate at the base, with rather scattered cystoliths on both sides, shortly or rather coarsely dentate; stipules soon falling, broadly oblong, about 1 cm. long 2. *ceratomera*

Leaves at most 3 cm. long and 2·5 cm. broad, not acuminate, rounded or subcordate at the base, coarsely dentate, with scattered cystoliths; stipules persistent, suborbicular .. .. 3. *stipulata*

Flowers in a flat terminal sessile corymb involucrate by the four uppermost leaves; stems weak; leaves broadly ovate, crenate-serrate, up to 2·5 cm. long and broad, laxly clothed with cystoliths; stipules suborbicular, membranous 4. *tetraphylla*

Besides the above, the commonly cultivated "Artillery Plant," *Pilea microphylla* Liebm., occurs here and there in the area; according to Deighton, it is abundant on walls in Freetown, Lagos (*Deighton* 2052), and *Moiser* (No. 27) has gathered it at Sokoto, N. Nigeria. The leaves are very unequal-sized in each pair, and are small and rounded, entire.

1. **Pilea sublucens** *Wedd.*—F.T.A. 6, 2 : 273. *Urera begonioides* A. Chev. A glabrous herb with slender stems, erect, 6–18 in. high from a creeping base; leaves of each opposite pair more or less unequal in size or length of petiole.
French Guinea: various localities! Sierra Leone: Bikongo Falls, Suva River (July, Aug.)! Cameroons Mt., Buea! Fernando Po: Clarence Peak, 4,000 ft. (Dec.)! Exsicc.—*Mann* 630. *Dawe* 535. *Preuss* 573; 953. *Chev.* 18815.
2. **P. ceratomera** *Wedd.*—F.T.A. 6, 2 : 269, partly. Stem creeping and rooting, with erect smooth branches 6 in. to 2 ft. high and opposite leaves with long slender petioles.
Fernando Po: Clarence Peak, 4,000 ft. (Dec.)! Also in St. Thomas Island, Belgian Congo, Uganda, E. Africa and the Mascarene Islands. Exsicc.—*Mann* 626.
3. **P. stipulata** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, 1ned. *P. ceratomera* Rendle, F.T.A. 6, 2 : 269, partly, not of Wedd. Stems lax, 2–3 ft. high from a creeping base, the opposite leaves subequal or on unequal petioles.
Cameroons Mt., 7,000–8,000 ft. (Dec.)! Exsicc.—*Mann* 2011. *Johnston* 66.
4. **P. tetraphylla** *Blume*—F.T.A. 6, 2 : 270 (incl. var. *major* Rendle). A herb, erect, slender, simple or branched, 1–6 in. high, sometimes from a creeping base, glabrous.
Cameroons Mt., 7,000 ft. (Dec.)! Above Buea. Also in Abyssinia, Eritrea, E. Africa and Madagascar. Exsicc.—*Mann* 2012.

11. LECANTHUS Wedd.—F.T.A. 6, 2 : 276.

Small herb with a densely rooting creeping underground stem; leaves ovate-lanceolate, broadly acute, cuneate at the base, 2–3·5 cm. long, 0·8–1·5 cm. broad, coarsely den-

tate, with numerous linear cystoliths prominent on the upper surface ; petiole 0·5 cm. long ; inflorescence orbicular, up to 1 cm. diam. ; peduncle slender, 2–2·5 cm. long *pedunculariis*

Lecanthus peduncularis *Wedd.*—F.T.A. 6, 2 : 276. A weak herb, simple or branched, half succulent, glabrous, 1–10 in. high.
Cameroons Mt.: Buea and above, 6,000–7,000 ft. (Jan.)! Fernando Po; Clarence Peak, 7,500 ft. (Mar.)! Also in Abyssinia; common in the eastern tropics. Exsicc.—*Mann* 1461. *Dunlap* 237.

88. CANNABINACEAE

Erect or scandent herbs. Leaves alternate or opposite, simple, undivided or more or less palmately lobed ; stipules present. Flowers dioecious, axillary, male paniculate, female sessile, crowded or strobilate, with large persistent bracts. Male flower : calyx 5-partite, segments imbricate ; petals absent ; stamens 5, erect in bud ; anthers 2-celled. Female flower : calyx closely enveloping the ovary, entire ; ovary sessile, 1-celled ; style 2-partite. Ovule solitary, pendulous. Fruit an achene, covered by the persistent calyx. Seed with fleshy endosperm and curved or spiral embryo.

CANNABIS Tourn.—F.T.A. 6, 2 : 16.

Stem erect ; leaves alternate or opposite, palmately divided ; achene covered by the persistent calyx ; embryo curved.

A leafy annual herb ; stems minutely puberulous and glandular ; leaves gland-dotted. alternate, or the lower opposite, palmately divided mostly to the base into 5 or more linear-lanceolate toothed acuminate segments ; stipules subulate ; male flowers greenish in lax axillary and terminal clusters ; styles long and filiform ; fruit about 5 mm. long, finely reticulate .. .. *sativa*

C. sativa *Linn.*—F.T.A. 6, 2 : 16 ; Holl. 4 : 614 ; Chev. Bot. 590.
The Common, European or Indian Hemp, a native of Asia widely cultivated but rarely in the area of this flora.

89. CELASTRACEAE

Erect trees, shrubs or climbers, sometimes spiny. Leaves alternate or opposite, simple ; stipules inconspicuous or absent. Flowers mostly cymose or fasciculate, usually hermaphrodite, actinomorphic, small. Calyx 4–5-lobed, lobes imbricate or rarely valvate. Petals 5, imbricate or valvate. Stamens 4–5, rarely more, alternate with the petals ; anthers 2-celled, opening lengthwise. Disk usually present. Ovary superior, 1–5-celled ; style short, more or less 3-lobed. Ovules mostly 2, from the inner angle of the cells. Fruit various, small. Seeds mostly with fleshy endosperm and rather large straight embryo.

Generally distributed but fairly numerous in the drier regions of the tropics. The presence of a disk in the small often greenish flowers and the 4–5 stamens alternate with the petals are marks of distinction.

Fruit a capsule ; leaves alternate ; branchlets usually spinescent
1. **Gymnosporia**

Fruit a drupe ; leaves opposite ; branchlets not spinescent
2. **Elaeodendron**

1. GYMNOSPORIA W. & A.—F.T.A. 1 : 360, as *Celastrus*.

Flowers subsessile in axillary fascicles ; branchlets not spiny, prominently angular ; leaves ovate-elliptic, acute, very shortly cuneate at the base, 6–11 cm. long, 2·5–5 cm. broad, shining above, glabrous, rather coarsely serrate ; pedicels up to 1 mm. long ; sepals very small .. .. 1. *fasciculata*

Flowers in branched cymes :

Cymes dichotomously much-branched, usually from near the base, sometimes borne on the spine-tipped branchlets ; branchlets flexuous, terete or nearly so ; leaves obovate to obovate-elliptic, rounded or emarginate at the apex, long-cuneate at the base, variable in size, up to 15 cm. long and 7 cm. broad, glaucous-green, closely serrulate ; flowers small and numerous ; fruits 2-valved, about 7 mm. long ; seeds shining, partly embedded in a large aril .. .. 2. *senegalensis*

Cymes with few branches on a slender peduncle ; young branchlets slightly ribbed ; spines axillary, short or long ; leaves elliptic to obovate-oblanceolate, subacutely

acuminate, cuneate at the base, 7–15 cm. long, 3–6 cm. broad, crenulate, closely reticulate, glabrous; flowers very small and few; fruit-valves about 1 cm. long
3. *gracilipes*

1. **Gymnosporia fasciculata** *Loes.* ms. A glabrous shrub.
Togo: near Lome! Exsicc.—*Warnecke* 335.
2. **G. senegalensis** *Loes.* in Engl. Bot. Jahrb. 17: 541; Holl. 1: 160. *Celastrus senegalensis* Lam.—F.T.A. 1: 361; Chev. Bot. 130. *C. coriaceus* Guill. & Perr. Tent. Fl. Seneg. 1: 142, t. 36. *C. littoralis* A. Chev. Bot. 129. A glabrous, often glaucous shrub, up to 15 ft. high, with pale or purple-reddish branchlets and small whitish flowers.
Common throughout the area in savannah regions and sometimes on the sea-coast; throughout tropical Africa to Rhodesia and extending to Arabia. Exsicc.—*Heudelot. Brunner. Barter* 776; 780. *Sc. Elliot* 5090. *Rowland. Elliott* 168. *Farmar* 111. *Chev.* 3177; 17929; 19944. *Kersting* A. 224. (See Appendix).
3. **G. gracilipes** *Loes.* l.c. *Celastrus gracilipes* Welw.—F.T.A. 1: 361. A shrub or small tree with the appearance of the preceding.
S. Nigeria: Ambas Bay (Dec.)! extending to Angola and Uganda. Exsicc.—*Mann* 2153.

2. ELAEODENDRON Jacq. f.—F.T.A. 1: 365.

Branchlets terete, glabrous; leaves opposite, elliptic, shortly acuminate, remotely crenate, 7–15 cm. long, 3·5–8 cm. broad, glabrous and laxly nerved; petiole up to 1·5

FIG. 158.—GYMNOSPORIA SENEGALENSIS *Loes.* (CELASTRACEAE).

A, flowering branch. B, flower. C, longitudinal section of same. D, flower from below with corolla removed. E, cross section of ovary. F, fruits. G, dehiscing fruit. H, seed showing aril.

cm. long; flowers very small and numerous in axillary or supra-axillary cymes up to ½ as long as the leaf; drupe ellipsoid or obovoid, glabrous, about 1·5 cm. long
Afzelii

E. Afzelii *Loes.* in Engl. Bot. Jahrb. 28: 157. *E. Warneckei* Loes. A glabrous shrub or small tree resembling the cherry-laurel, with resinous wood.
Sierra Leone! Togo: near Lome, in the coastal scrub (Jan.)! Kpedyi, Nyamassila (fl. Jan., fr. June)! Exsicc.—*Afzelius. Warnecke* 45. *Kersting* A. 269. (See Appendix).

90. PANDACEAE

Small trees. Leaves alternate, simple, serrulate; stipules present. Flowers dioecious. Male flowers racemose, the racemes fasciculate from the old wood. Calyx cupular, open in bud. Petals 5, valvate. Stamens 10, alternately long and short; anthers 2-celled, opening lengthwise. Rudimentary ovary linear-subulate. Female flowers arranged like the male. Calyx cupular, truncate or toothed. Petals 5 [imbricate ?]; staminodes absent. Ovary subsessile, 3–4-celled;

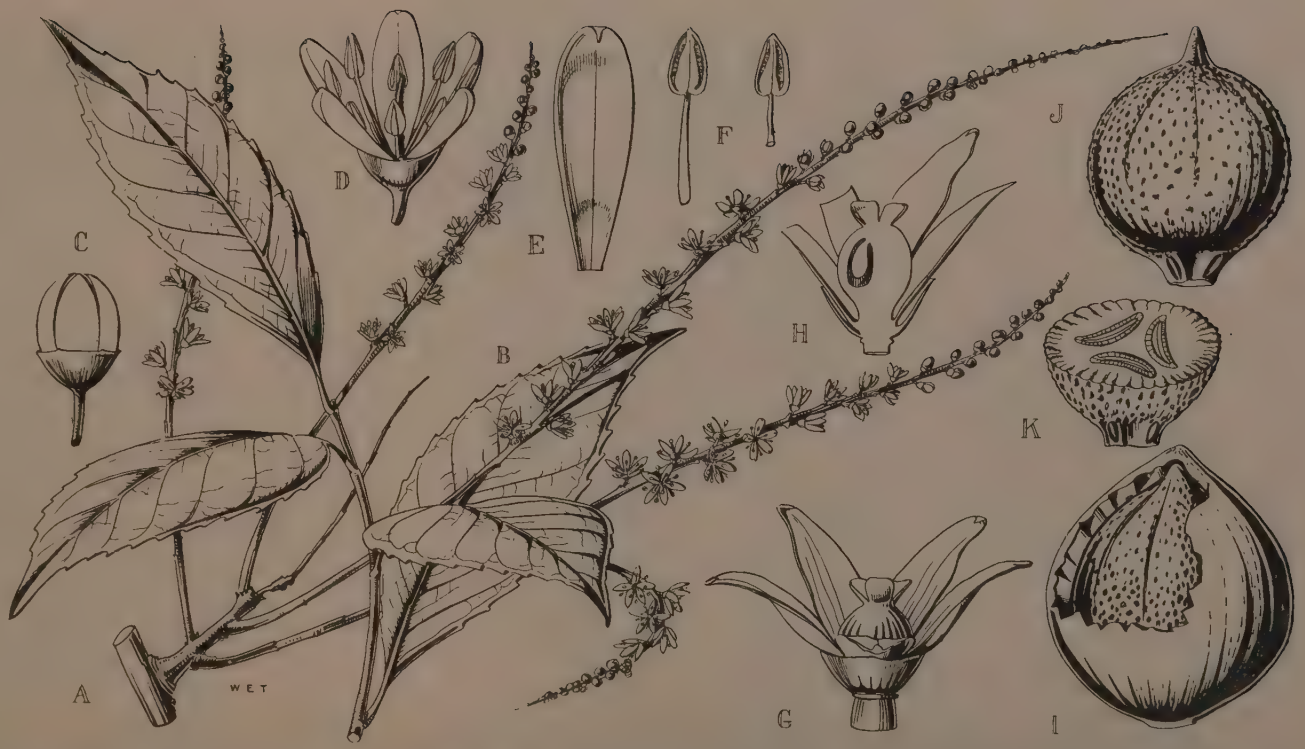

FIG. 159.—PANDA OLEOSA *Pierre* (PANDACEAE).

A, flowering branch. B, leaf. C, flower-bud. D, male flower. E, petal. F, stamens. G, female flower. H, the same in vertical section. I, fruit partially cut open. J, stone. K, cross section of same.

stigmas 3–4, reflexed; ovule solitary, pendulous. Fruit drupaceous. Seeds with copious oily endosperm; cotyledons cordate.

A small family endemic to West Tropical Africa.

PANDA Pierre in Bull. Soc. Linn. Paris 2 : 1255 (1894).

Characters of the family:
A tree; branchlets slightly angular; leaves elliptic or ovate-elliptic, unequal-sided and more or less cuneate at the base, obliquely caudate-acuminate, 10–18 cm. long, 4–9 cm. broad, glabrous, rather closely reticulate below; petiole about 1 cm. long; flowers in elongated fasciculate or paniculate racemes; pedicels about 2 mm. long, puberulous; calyx truncate, about 1·25 mm. long; petals puberulous on the margin, 3 mm. long; fruit subglobose, 3–4-seeded, about 6 cm. diam., with a thick exocarp and a hard bony endocarp traversed by cavities giving the outside a deeply pitted appearance; seeds boat-shaped .. .. *oleosa*

P. oleosa *Pierre* l.c.; Chev. Bot. 612. *Porphyranthus Zenkeri* Engl. A tree up to 60 ft. or more high; inflorescence often in the axils of the fallen leaves; flowers red or purplish.
Ivory Coast: Guidéko (June)! Bouroukrou (Dec.–Jan.)! Indénlé. Gold Coast: Tarkwa, Bonsa R. (Aug.)! Saltpond, Baku (June)! Extends to Portuguese Congo. Exsicc.—*Vigne* 949; 980. *Chev.* 16129; 19043. (See Appendix).

91. HIPPOCRATEACEAE

With M. B. Moss

Mostly glabrous small erect trees or shrubs, or scandent. Leaves mostly opposite, simple; stipules usually absent. Flowers fasciculate or cymose, hermaphrodite, actinomorphic, mostly quite small. Calyx small, 5-partite, lobes imbricate. Petals 5, imbricate or valvate. Disk present, conical, cupular or expanded. Stamens mostly 3, rarely 2–5, inserted on the disk, alternate with the petals; anther-cells distinct or confluent. Ovary superior or more or less confluent with the disk, 3-celled; style subulate or short, mostly 3-fid; ovules 2–10 in each cell, axile, 1–2-seriate. Fruit capsular and compressed or baccate. Seeds compressed and often winged or angular, without endosperm; cotyledons large, connate, thick.

A small tropical and subtropical family characterised by the opposite exstipulate leaves, fasciculate or cymose flowers, 3 stamens with broad filaments inserted on a fleshy disk.

Inflorescence pedunculate; fruits dehiscent, flat; seeds compressed, usually winged at one end .. .. 1. **Hippocratea**
Inflorescence not pedunculate or rarely so; fruits indehiscent, baccate; seeds not winged.. .. .. 2. **Salacia**

1. HIPPOCRATEA Linn.—F.T.A. 1 : 366; Loes. in Engl. Bot. Jahrb. 34 : 103 (1904).

Petals hairy outside:
Leaves tomentellous or pilose on the nerves below:
Indumentum very short; leaves broadly elliptic, abruptly and shortly acuminate, rounded at the base, about 8 cm. long and 5 cm. broad; lateral nerves 4 pairs; inflorescence loosely paniculate, cymose; sepals ovate, 4 mm. long; petals fringed, spathulate-obovate .. .. 1. *velutina*
Indumentum long and spreading, rusty-brown; leaves obovate-elliptic, obtuse at the apex, rounded or shortly cuneate at the base, same size as above; lateral nerves 5–6 pairs; inflorescence large and laxly cymose; petals ovate-trinagular 2. *iotricha*

Leaves glabrous below:
Leaves broadly obovate, cuneate at the base, more or less truncate or broadly rounded at the apex, about 12 cm. long and 6 cm. broad; flowers very numerous and very small, forming a large corymbose dichotomous terminal cyme .. 3. *myriantha*
Leaves elliptic to slightly obovate-oblong, not or only very slightly cuneate at the base, more or less acuminate; flowers larger than above and much fewer:
Petals puberulous on the outside, 7–9 mm. long; pedicels 1·5 cm. long:
Leaves shortly cuneate at the base, about 12 cm. long and ½ as broad, lateral nerves about 8 pairs; petals usually reflexed in flower; disk conspicuous, 1·5 mm. long; fruit narrowly ovate, 11 cm. long, 3 cm. broad, markedly veined 4. *clematoides*

Leaves rounded at the base, about 16 cm. long and 9 cm. broad, lateral nerves about 10 pairs, reticulation very conspicuous, membranous; flowers smaller than above and petals not reflexed .. .. 5. *venulosa*

Petals tomentose on the outside, 2 mm. long, not reflexed in flower; pedicels quite short .. .. 6. *guineensis*

Petals glabrous outside:

Flower-buds just before opening more or less triangular or narrowly ovoid:

Leaves rather long-acuminate, about 10 cm. long and 5 cm. broad, obscurely crenate; lateral nerves about 4 pairs; cymes short, subsessile and very few-flowered; sepals 1 mm. long; petals lanceolate, 5 mm. long .. .. .. 7. *Rowlandii*

Leaves rounded or only very shortly acuminate, elliptic, about 7 cm. long and 4 cm. broad or less, crenate or almost entire; cymes few-flowered, usually fairly long-pedunculate; flowers about 3 mm. long; fruit oblanceolate to obovate, about 6·5 cm. long .. .. 8. *Richardiana*

Flower-buds just before opening globose:

Flowers few in very lax dichotomous cymes; peduncle about 4 cm. long:

Leaves broadly ovate-elliptic, shortly acuminate or obtusely pointed at the apex, shortly cuneate at the base, about 22 cm. long and 12 cm. broad, thick and

FIG. 160.—HIPPOCRATEA RICHARDIANA *Cambess.* (HIPPOCRATEACEAE).

A, flower. B, C, stamen front and back. D, ovary in cross section. E, dehiscing fruit. F, seed.

coriaceous; lateral nerves about 6 pairs, venation markedly reticulate; pedicels about 1 cm. long; petals 8 mm. long .. .. 9. *macrophylla*

Leaves elliptic, rather long- and sharply acuminate, up to 10 cm. long and 5 cm. broad, thin and membranous; lateral nerves about 4 pairs, tertiary nerves not conspicuous; pedicels much shorter than above; petals 2 mm. long 10. *Preussii*

Flowers in closer and smaller cymes than above; petals much smaller; peduncle shorter:

Leaves gradually and very long-acuminate, glandular-serrate, elliptic, cuneate at the base, 8 cm. long, 3 cm. broad; petiole furrowed on the upper surface; inflorescence about ⅓ as long as the leaves; pedicels 4-angled; bracts 3 mm. long 11. *Chevalieri*

Leaves shortly and rather abruptly acuminate:

Inflorescence about as long as the petiole or only slightly longer; leaves elliptic, cuneate at the base, 9 cm. long, 4·5 cm. broad; lateral nerves about 4 pairs; flowers 1 mm. long .. .. 12. *pallens*

Inflorescence much longer than the petiole:

Leaves distinctly crenate, elliptic, about 15 cm. long and 9 cm. broad; lateral nerves about 4 pairs, ascending, with numerous distinct parallel tertiary nerves; inflorescence ½ as long as leaves, closely and repeatedly dichotomous; bracts conspicuous, small .. .. 13. *paniculata*

Leaves entire or very obscurely toothed :
Petals broadly ovate, nearly as broad as long ; leaves entire :
Leaves elliptic, acutely triangular-acuminate, 5 cm. long, 2·5 cm. broad ; inflorescence about as long as leaves or less, tomentose .. 14. *Thomasii*
Leaves obovate-elliptic, 8 cm. long, 5 cm. broad ; inflorescence glabrous ; fruits lanceolate, 5 cm. long and 1·5 cm. broad .. .. 15. *Welwitschii*
Petals spathulate or narrow, much longer than broad ; leaves slightly toothed :
Fruits about twice as long as broad ; leaves obovate to elliptic, about 7 cm. long and 4 cm. broad ; lateral nerves about 4 pairs ; inflorescence usually about ½ as long as the leaves ; flowers very small .. 16. *Oliveriana*
Fruits about 4 times as long as broad ; leaves elliptic or ovate, about 9 cm. long and 4 cm. broad, more or less cuneate at the base ; inflorescence almost as long as or longer than the leaves ; flowers numerous, small, 1 mm. long 17. *Loesneriana*

1. **Hippocratea velutina** *Afz.*—F.T.A. 1 : 370 ; Loes. in Engl. Bot. Jahrb. 34 : 120 ; Chev. Bot. 132. incl. var. *apiculata* A. Chev. Climbing shrub with rusty-tomentose branchlets ; fruits deeply divided into 2 or 3 oblong-oblanceolate velutinous carpels about 2 in. long.
French Guinea : between Ymbo and Kouria (Nov.). Sierra Leone : numerous localities ! Liberia : near Lango ! Peahtah ! Ivory Coast : North Baoulé (July) ! S. Nigeria : Lagos ! Extends to Gabon and Uganda. Exsicc.—*Thomas* 1711 ; 9355 ; 10349. *Dawe* 527. *Lane-Poole* 355. *Sc. Elliot* 4183. *Chev.* 22107. *Linder* 303 ; 1099.
2. **H. iotricha** *Loes.* l.c. 108. Like the last but more roughly hairy and flowers smaller.
S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Talb.* 1375.
3. **H. myriantha** *Oliv.*—F.T.A. 1 : 369 ; Loes. l.c. 106 ; Chev. Bot. 131. Climbing shrub, sometimes on the ground ; flowers very small, white, in large terminal corymbs ; fruits oblong, flat, very glaucous.
Sierra Leone : Bagroo R. (Apr.) ! Ivory Coast : Dabou (Feb.). S. Nigeria : Eket ! Bonny R. (Feb.) ! Calabar (Feb.) ! Brass ! Nun R., sea-shore ! Extends to Gabon. Exsicc.—*Mann* 790 ; 2309. *Kalbreyer* 49. *Barter* 1864 ; 20117. *Talb.* 3165. *Chev.* 17251.
4. **H. clematoides** *Loes.* l.c. 109. A clematis-like climber with yellow flowers in very loose open cymes ; fruits in threes, oblong, flat, emarginate, 2 in. long.
Sierra Leone ! S. Nigeria ! Extends to Gabon and in Uganda. Exsicc.—*Thomas* 2266 ; 10132.
5. **H. venulosa** *Hutch. & M. B. Moss* in Kew Bull. 1928, ined. Like the last but with shining markedly venulose leaves
Sierra Leone ! Exsicc.—*Thomas* 10225 ; 10550.
6. **H. guineensis** *Hutch. & M. B. Moss* in Kew Bull. 1928, ined. *H. apocynoides* Oliv.—F.T.A. 1 : 368 ; Chev. Bot. 130, not of Welw. Climbing shrub 10–12 ft., with very small brownish flowers and narrowly elliptic flat shortly pubescent fruits 2 in. long.
French Guinea : Kouria (June) ! Sierra Leone : Konnoh country ! Ivory Coast : mouth of the Cavally (Aug.). Gold Coast : Akwapim Hills (Oct.) ! Togo : near Lome ! N. Nigeria : top of Mt. Patti ! S. Nigeria : mouth of Niger (Aug.) ! Cameroons R. (Jan.) ! Lagos ! Exsicc.—*Chev.* 14953 ; 19896. *Thomas* 8371. *Burbidge* 499. *Johnson* 776. *Warnecke* 404. *Dalz.* 204. *Mann* 456 ; 2218. *Millen* 60. (See Appendix).
7. **H. Rowlandii** *Loes.* in Engl. Bot. Jahrb. 19 : 236 and l.c. 110 ; Chev. Bot. 132. Climber with yellowish flowers and flat woody obovate glabrous fruits about 2 in. long.
French Guinea : Kaba Valley (May). Ivory Coast : Bouroukrou (Dec.) ; between Bokasso and Promprom (Mar.). Gold Coast : Kwahu (Apr.) ! Opnoase (May) ! S. Nigeria : Lagos ! Oban ! Also in French Cameroons. Exsicc.—*Farmar* 465. *Johnson* 645. *Rowland. Millen* 24. *Chev.* 13126.
8. **H. Richardiana** *Cambess.* in St. Hil. Fl. Bras. Mer. 2 : 102 ; Guill. & Perr. Tent. Fl. Seneg. 1 : 112, t. 28. *H. obtusifolia* Oliv.—F.T.A. 1 : 369 ; Chev. Bot. 131, not of Roxb. *H. obtusifolia* var. *Richardiana* Loes. *H. cymosa* var. *Schweinfurthiana* and *togoensis* Loes. A climber with greenish-red fragrant flowers, thick veiny leaves and obovate flat fruits about 2 in. long.
French Sudan : Badinko (Jan.). Balani (Jan.). Senegal : various localities ! Sierra Leone : Samaia ! Likuru ! Falaba (Mar.) ! Liberia : Peahtah ! Togo : Lome ! N. Nigeria : Katagum ! Nupe ! Extends to East Africa and south to the Zambesi and Angola. Exsicc.—*Döllinger* 32. *Perrottet* 95. *Heudelot. Thomas* 223. *Sc. Elliot* 4965 ; 5138. *Warnecke* 43 ; 158 ; 309. *Dalz.* 217. *Barter* 1215. *Chev.* 113 ; 148 ; 3174 ; 24628. *Linder* 1027. (See Appendix).
9. **H. macrophylla** *Vahl*—F.T.A. 1 : 371 ; Loes. l.c. 115 ; Chev. Bot. 131. Shrub or climber with large leaves and very loose cymes of greenish or whitish flowers and large obovate fruits in threes about 3½ in. long and 2½ in. broad, markedly flabellately nerved.
French Guinea : Conakry ! Sierra Leone : various localities ! Liberia : near Monrovia ! Ivory Coast : various localities. Gold Coast ! S. Nigeria : Oban ! Calabar ! South to Gabon and Congo. Exsicc.—*Thomas* 8349 ; 8393. *Barter* 21. *Dalz.* 950. *Lane-Poole* 328. *Talb.* 1406. *Mann* 2292. *Chev.* 17768, etc.
10. **H. Preussii** *Loes.* l.c. 112.
Cameroons Mt. : between Victoria and Bimbia (July) ! Exsicc.—*Preuss* 1306.
11. **H. Chevalieri** *Hutch. & M. B. Moss* in Kew Bull. 1928, ined. A shrub with holly-like leaves and small cymes.
Ivory Coast : Mt. Kouan, 1,250 ft. (Apr.) ! Exsicc.—*Chev.* 21242.
12. **H. pallens** *Planch.* ex *Oliv.*—F.T.A. 1 : 367, partly ; Loes. l.c. 103 ; Chev. Bot. 131. Woody twiner with olive-green leaves and very small yellow flowers.
Senegal ! French Guinea : Kouroussa (Apr.) ! Labé (Mar.) ! Sierra Leone : Magbile ! Mabum ! Dantilia R. ! Batkanu ! Ivory Coast : various localities. Dahomey : Atacora Mts., 1,250–1,600 ft. N. Nigeria : Katagum ! Exsicc.—*Heudelot* 341. *Pobéguin* 691 ; 892. *Chev.* 12240, etc. *Thomas* 17 ; 1659 ; 6144. *Dalz.* 412.
13. **H. paniculata** *Vahl*—F.T.A. 1 : 371 ; Loes. l.c. 113 ; Chev. Bot. 132. A large scandent shrub with large nervose leaves and close cymes of minute white flowers.
Senegal : Casamance ! French Guinea : Labé (Mar.–Apr.). Sierra Leone : sea-beach at Kent ! Kamalu ! Ivory Coast : Middle Sassandra R. (May). S. Nigeria : Agbemia ! Exsicc.—*Farmar* 240. *Smythe* 246. *Thomas* 374 ; 10297. *Barter* 3363.
14. **H. Thomasii** *Hutch. & M. B. Moss* in Kew Bull. 1928, ined.
Liberia : Bonute ! Gbanga ! S. Nigeria ! Exsicc.—*Thomas* 699 ; 883 ; 1663.
15. **H. Welwitschii** *Oliv.*—F.T.A. 1 : 367 ; Loes. l.c. 112. Flowers very small, white ; fruits in threes, flat, lanceolate, about 2 in. long.
French Guinea ! Sierra Leone : Magaso (Aug.) ! Pendembu (July) ! Kurusu (Apr.) ! Layah (Jan.) ! Liberia : Gbanga ! Gold Coast : Kroboe (July) ! S. Nigeria : Lagos ! Eket ! Extends to Angola. Exsicc. —*Pobéguin* 815. *Thomas* 860 ; 1377 ; 10486. *Sc. Elliot* 4659 ; 5547. *Johnson* 1109. *Foster* 61. *Talb.* 3135. *Linder* 692. (See Appendix).
16. **H. Oliveriana** *Hutch. & M. B. Moss* in Kew Bull. 1928, ined. *H. pallens* Oliv.—F.T.A. 1 : 367, partly, not of Planch. Climber with minute greenish-yellow flowers and narrowly obovate fruits about 1 in. long.

Sierra Leone: Bagroo R. (Apr.)! Dantilia (Mar.)! Liberia: Monrovia! Gold Coast: E. Akim! Togo: Lome! S. Nigeria: Oban! Extends to Angola. Exsicc.—*Mann* 855. *Sc. Elliot* 5270. *Johnson* 760. *Warnecke* 157; 302. *Talb.* 1447.

17. **H. Loesneriana** *Hutch. & M. B. Moss* in Kew Bull. 1928, ined. *H. indica* Oliv.—F.T.A. 1: 368, not of Willd.; Loes. l.c. 106; Chev. Bot. 130. Shrub 10–12 ft., with small whitish or greenish flowers in loose cymes; fruits narrowly oblong, about 1½ in. long, emarginate.

French Guinea: Futa Jallon (Apr.). Sierra Leone: various localities! Liberia: Gbanga! Du River! Ivory Coast: Mt. Kouan! Gold Coast! N. Nigeria: Nupe! S. Nigeria: Lagos (Jan.)! Fernando Po (Jan.)! Extends to Angola. Exsicc.—*Thomas* 3702. *Sc. Elliot* 4456; 4662. *Lane-Poole* 48; 381. *Dalz.* 8135. *Chev.* 18145; 18618; 21243. *Irvine* 385. *Dawodu* 128. *Millen* 110. *Mann* 185. *Linder* 283; 490; 808. (See Appendix).

2. SALACIA Linn.—F.T.A. 1: 372; Loes. in Engl. Bot. Jahrb. 44: 156 (1910).

* Flowers solitary or fasciculate in the leaf axils, not in pedunculate cymes:
Leaves not acuminate, at most broadly and obtusely pointed:
Leaves elliptic, broadly rounded at the apex, about 6 cm. long and 3·5 cm. broad, obscurely crenate, smooth above, conspicuously reticulate below; flower-buds broadly ovoid, flowers very short-stalked .. .. 1. *lomensis*
Leaves obovate to oblong-elliptic, apex not broadly rounded; pedicels up to 1 cm. long:
Flowers numerous in a cluster; pedicels about 1 cm. long; flowers 5 mm. in diam.; leaves distinctly cuneate at the base .. .. 2. *Elliotii*
Flowers fewer in a cluster than above; pedicels about 5 mm. long; flowers 8 mm. in diam.; leaves scarcely acuminate .. .. 3. *togoica*
Leaves more or less distinctly acuminate:
Branches broadly quadrately winged; leaves subsessile, cordate at the base, oblong to slightly obovate, about 20 cm. long, 8 cm. broad; lateral nerves about 11 pairs; petiole about 2 mm. long; flowers few, axillary; pedicel less than 1 cm. long; sepals fimbriate on the margin .. .. 4. *alata*
Branches not or only slightly winged; leaves petiolate, not cordate:
Pedicels about 2 cm. long or more, filiform:
Lateral nerves 11–14 pairs:
Leaves oblong to slightly obovate, acumen up to 2·5 cm. long, cuneate at the base, about 19 cm. long and 6 cm. broad, midrib very prominent and raised above and below, lateral nerves widely ascending and looped about 3 mm. from the margin, distinctly impressed above, tertiary nerves conspicuous below; petiole about 6 mm. long; petals 2 mm. long and over 3 mm. broad, sometimes very slightly emarginate at the apex .. .. 5. *loloensis*
Leaves elliptic to oblong, shortly and obtusely acuminate, cuneate at the base, slightly smaller than above, venation not so distinct as above; petiole quite 1 cm. long and furrowed on the upper surface; petals obovate, 3 mm. long and as much broad, not emarginate .. .. 6. *eurypetala*
Lateral nerves about 6 pairs:
Flowers over 1 cm. in diam., rather numerous; leaves oblong or slightly obovate, about 19 cm. long and ½ as broad; pedicels about 4 cm. long; petals broadly obovate, about as broad as long .. .. 7. *Zenkeri*
Flowers up to 5 mm. diam.:
Leaves crenate, more or less obovate, 6– about 12 cm. long and up to ½ as broad; petiole up to 5 mm. long; petals obovate .. .. 8. *debilis*
Leaves entire, broadly elliptic:
Petals obovate, as broad as long; flowers very numerous in each fascicle; leaves about 15 cm. long and 9 cm. broad; petiole up to 1·2 cm. long, thick 9. *pyriformoides*
Petals oblong, about ½ as broad as long; flowers not so numerous as above; leaves similar to above .. .. 10. *Dusenii*
Pedicels under 2 cm. long, usually fairly stout:
†Flowers fasciculate in the leaf-axils (not solitary):
Leaves about 3–4 times as long as broad, oblanceolate or oblong-oblanceolate:
Leaves abruptly acuminate, margin almost entire, up to 15 cm. long; lateral nerves about 6 pairs; pedicels about 6 mm. long; flowers not more than 3 mm. in diam. .. .. 11. *Mannii*
Leaves gradually acuminate, margin distinctly crenate, not more than 10 cm. long; lateral nerves about 9 pairs; pedicels about 1·5 cm. long; flowers 1 cm. in diam., oblong in bud; lenticels very numerous on the branchlets 12. *angustifolia*
Leaves about twice as long as broad, elliptic to slightly obovate-oblong:
Buds just before opening more or less elongated, about twice as long as broad:
Leaves almost entire, about 10 cm. long or more; lenticels very numerous and conspicuous; fruit ellipsoid, 4 cm. long, 2·5 cm. broad 13. *senegalensis*
Leaves distinctly crenate, lateral nerves about 9 pairs, venation conspicuous:
Leaves cordate at the base, abruptly and long-acuminate with obtuse apex; petiole about 3 mm. long, with very wavy margins; flowers few in a cluster

not more than 3 mm. long; pedicels slender, about 1·5 cm. long; petals oblong .. .. 14. *volubilis*

Leaves more or less cuneate at the base; petiole over 5 mm. long; flowers more numerous in a cluster:

Leaves broadly elliptic, 10–15 cm. long:

Pedicel about 1·5 cm. long; buds quite 5 mm. long and 2 mm. broad; leaves very shortly acuminate .. .. 15. *euryoides*

Pedicel nearly 2 cm. long; buds 4 mm. long and narrower than above; leaves larger and distinctly acuminate .. .. 16. *macrocarpa*

Leaves obovate-oblong, narrowed at both ends, about 8 cm. long and 3·5 cm. broad, undulate and crenate; pedicels about 1 cm. long 17. *Dalzielii*

Buds globose just before opening, at least as broad as long:

Leaves distinctly toothed, about 8 cm. long and 4·5 cm. broad, very shortly cuneate at the base to almost rounded; buds 4–5 mm. long; lenticels numerous on older branches .. .. 18. *chlorantha*

Leaves entire or only obscurely toothed; buds at most only 3 mm. long:

Leaves up to about 9 cm. long and ½ as broad, usually asymmetrically acuminate; stems striate:

Leaves rather abruptly cuneate at the base; petiole up to about 1 cm. long, furrowed above; pedicels up to 1·5 cm. long; flower clusters not dense 19. *cornifolia*

Leaves gradually cuneate at the base, subsessile; pedicels at most only 0·5 cm. long; flower clusters very dense; petals about 2 mm. long and as much broad at the base, triangular, marked venation .. 20. *Gilgiana*

Leaves over 10 cm. and up to 20 cm. long:

Leaves oblong, rather abruptly acuminate, shortly cuneate at the base; midrib depressed above, very prominent below; petiole about 1·5 cm. long, stout; pedicels up to 1·5 cm. long, usually rather less, stout; flower-buds up to 4 mm. long .. .. 21. *pyriformis*

Leaves oblong-oblanceolate, abruptly and bluntly acuminate, cuneate at the base; midrib raised above and below; petiole 1 cm. long, furrowed; pedicels usually 2 cm. long or slightly under, filiform; flower-buds only about 2 mm. long .. .. 10. *Dusenii*

†Flowers solitary or subsolitary in the leaf-axils:

Leaves about 2 cm. broad, usually abruptly acuminate:

Leaves more than 3 times as long as broad, oblong, tapering at both ends, about 7 cm. long, crenate; lateral nerves about 4 pairs; fruit obovoid to rounded, about 1·5 cm. long .. .. 22. *alpestris*

Leaves about twice as long as broad:

Leaves oblanceolate, almost entire or inconspicuously toothed, about 7 cm. long, cuneate at the base, membranous .. .. 23. *rufescens*

Leaves ovate-oblong, distinctly crenate, 5–8 cm. long, shortly cuneate at the base, coriaceous; fruit rounded, about 1·5 cm. in diam. .. 24. *erecta*

Leaves about 5 cm. broad or more:

Petiole 5 mm. long; leaves oblong-lanceolate, up to 16 cm. long, membranous, crenate, the teeth often slightly hooked; lateral nerves about 8 pairs; fruit obovoid, 1 cm. long, about 6 mm. broad .. .. .. 25. *pallescens*

Petiole over 1 cm. long; leaves crenate or subentire, the teeth often gland-tipped:

Stem distinctly 4-angled in the young state with a slight tendency to becoming winged; leaves oblong to oblong-lanceolate, usually abruptly and asymmetrically acuminate, base rather gradually cuneate, lateral nerves about 7 pairs, texture thick and coriaceous .. .. 26. *Talbotii*

Stem rounded, striate, never 4-angled or ridged:

Pedicels about 2 cm. long; flowers 1·5 cm. diam.; leaves obovate-elliptic, cuneate at the base, up to 18 cm. long, indistinctly crenate, thick and glaucous; petiole distinctly furrowed above .. .. 27. *Preussii*

Pedicels under 1 cm. long; flowers at most 1 cm. diam.; leaves oblong, rather gradually acuminate, cuneate at the base, about 14 cm. long, distinctly and rather closely repand-serrulate .. .. .. 28. *fimbrisepala*

* Flowers in a pedunculate cluster or glomerule:

Common peduncle 2 cm. to about 6 cm. long; inflorescence usually repeatedly dichotomous; flowers 1 cm. diam.; petals broadly obovate; pedicels about 1–1·5 cm. long; leaves oblong to slightly oblanceolate-oblong, acuminate at the apex, rounded at the base, up to 19 cm. long and 7 cm. broad but usually much smaller; lateral nerves about 8 pairs .. .. 29. *camerunensis*

Common peduncle much less than 6 cm., rarely exceeding 1 cm. long; flowers usually not more than 5 mm. diam.:

Pedicels 2 cm. or more long, slender; flowers numerous in a fascicle; leaves oblong

to oblong-elliptic, rather abruptly acuminate, very shortly cuneate to almost rounded at the base, about 12 cm. long and ½ as broad or less; petals oblong, hardly exceeding 1 mm. long .. .. 30. *Staudtiana*

Pedicels much less than 2 cm. long; flowers less numerous in a fascicle:

Inflorescence repeatedly branched; leaves long- and gradually cuneate at the base, running into a petiole at least 1 cm. long, about 8 cm. long, and 4 cm. broad, inconspicuously crenate and slightly undulate; nerves not raised above; flower-buds elongated; petals oblong, 2 mm. long.. .. .. 31. *lucida*

Inflorescence not repeatedly branched; base of leaves not as above, and petiole usually under 1 cm. long; midrib raised above:

Leaves rounded or at most very shortly cuneate at the base:

Leaves obovate-elliptic to oblanceolate, abruptly acuminate, at least 10 cm. long but usually much longer:

Lateral nerves up to 6 pairs:

Leaves asymmetrically acuminate, very shortly cuneate at the base, entire, glaucous above, conspicuously reticulate below.. .. 32. *bipindensis*

Leaves symmetrically acuminate, subcordate at the base, subentire; petiole shorter than above; fruit ovoid with long pointed apex, 4–6 cm. long and about 2·5 cm. broad, strongly wrinkled and verrucose .. .. 33. *leonensis*

Lateral nerves 10–15 pairs; leaves oblong or obovate-oblong, abruptly acuminate (acumen 1·5 cm. long), 5–10 cm. long, 2·5–4 cm. broad; petiole 4–6 mm. long; pedicels about 1 cm. long .. .. 34. *Johannis-Albrechtii*

Leaves ovate-oblong, gradually acuminate and broadly rounded at the apex, usually not more than 8 cm. long, almost rounded at the base; pedicel about 7 mm. long; petals narrow-oblong, about 2 mm. long .. .. 35. *Whytei*

Leaves gradually cuneate at the base:

Cymes solitary in the leaf-axils:

Leaves elliptic to slightly obovate, very abruptly acuminate, rounded at the apex, 6·5–9 cm. long, 2·5–4 cm. broad; lateral nerves about 8 pairs, inconspicuous; inflorescence only 1 cm. long; flowers very small on slender pedicels; fruit broadly obovoid, narrowed very abruptly into a neck at the base, about 2 cm. long and 1·5 cm. broad.. .. .. .. 36. *Caillei*

Leaves elliptic to ovate, gradually tapering to the acumen, about 11 cm. long or more and 5 cm. broad; lateral nerves about 6 pairs; common peduncle shorter than above; pedicels stouter .. .. 37. *nitida*

Cymes fasciculate, 2–3 times as long as the petiole; leaves oblanceolate-obovate, subabruptly and obtusely acuminate, about 15 cm. long and 5–6 cm. broad, minutely denticulate in the upper half; lateral nerves about 7 pairs; pedicels about 4 mm. long, puberulous; sepals and petals puberulous .. 38. *Howesii*

1. **Salacia lomensis** *Loes.* in Engl. Bot. Jahrb. 44 : 170; Chev. Bot. 134 (erroneously as "S. leonensis Loes."). A shrub up to 6 ft. high.
Ivory Coast: Sassandra Basin (June). Banks of Cavally (July). Gold Coast! Togo: Lome (fr. Aug.)! Exsicc.—*Warnecke* 215. *Mildbraed.* 7477. *Chev.* 19131; 19327; 22004.
2. **S. Elliotii** *Loes.* l.c. 180. A small bush.
Sierra Leone: Mt. Kofiu, overhanging streams, 1,500 ft. (Jan.)! Exsicc.—*Sc. Elliot* 4595.
3. **S. togoica** *Loes.* l.c. 181. Shrub up to 30 ft. high, with orange flowers.
Sierra Leone: Benna (Jan.)! Gold Coast: Krobo Plains (Dec.)! Accra Plains (July)! Togo, near Misahöhe (Apr.–May)! Exsicc.—*Sc. Elliot* 4635. *Johnson* 500; 1048. *Baumann* 489, partly. (See Appendix).
4. **S. alata** *De Wild.* Miss. E. Laurent. i. 241.
S. Nigeria: Oban! Exsicc.—*Talb.* 1385; 1611.
5. **S. loloensis** *Loes.* l.c. 172. A shrub or small tree up to 12 ft. high.
Cameroons Mt.: Victoria (Apr.)! Also in French Cameroons. Exsicc.—*Schlechter* 12365.
6. **S. eurypetala** *Loes.* l.c. 174.
S. Nigeria: Johann-Albrechtshöhe (Apr.)! Exsicc.—*Staudt* 930.
7. **S. Zenkeri** *Loes.* l.c. 193. A climbing shrub or small tree with large leaves and long slender flower stalks.
S. Nigeria: Oban! Cameroons Mt.: between Victoria and Bimbia (May)! Also in French Cameroons. Exsicc.—*Talb.* 1589. *Preuss* 1254.
8. **S. debilis** *Walp.*—F.T.A. 1 : 376; Loes. l.c. 184; Chev. Bot. 133. A shrub or climber with yellowish flowers.
Senegal! French Guinea: Conokry and Los Isl. (Feb.). Sierra Leone: near Mussala (Mar.)! Mt. Aureole (Feb.)! Wallia (Jan.)! Kora (Feb.! Gold Coast! Fernando Po! Exsicc.—*Heudelot* 698; *Sc. Elliot* 4462; 4589; 5123. *Dalz.* 976. *Lane-Poole* 212. *Farmar* 550. *Mann* 1445. *Chev.* 12079; 12262. (See Appendix).
9. **S. pyriformoides** *Loes.* l.c. 186. A climber with large leaves and dense axillary clusters of flowers.
S. Nigeria: Oban! Also in French Cameroons. Exsicc.—*Talb.* 1420.
10. **S. Dusenii** *Loes.* l.c. 188.
Liberia: Peahtah! S. Nigeria: Oban! Also in French Cameroons. Exsicc.—*Talb.* 1420; 1760. *Linder* 864.
11. **S. Mannii** *Oliv.*—F.T.A. 1 : 376; Loes. l.c. 187. A small tree with white or yellow flowers.
Fernando Po (Jan.)! Exsicc.—*Mann* 242. *Barter.*
12. **S. angustifolia** *Scott Elliot* in Journ. Linn. Soc. 30 : 75. *S. macrocarpa* var. *angustifolia* Loes. l.c. 166.
Sierra Leone: Limba (Apr.)! Exsicc.—*Sc. Elliot* 5486.
13. **S. senegalensis** *DC.*—F.T.A. 1 : 374; Loes. l.c. 165; Chev. Bot. 135. Small tree or shrub with markedly lenticellate branchlets, axillary clusters of small white flowers, and hard ellipsoid fruits 1½ in. broad.
Common from Senegal to Dahomey. Exsicc.—*Heudelot* 34. *Perrottet* 97. *Dalz.* 944. *Mann* 798. *Sc. Elliot* 4787. *Lane-Poole* 148. *Vogel* 173; 179. (See Appendix).
14. **S. volubilis** *Loes. & Winkler* in Engl. Bot. Jahrb. 41 : 280.
Cameroons Mt.: Victoria (June)! Exsicc.—*Stössel & Winkler* 84.

15. **S. euryoides** *Hutch. & M. B. Moss* in Kew Bull. 1928, ined. *S. macrocarpa* var. *grandiflora* Loes. l.c. 166. Shrub with dense clusters of yellow flowers.
Sierra Leone: Talla Hills (Feb.)! Berria (Mar.)! Exsicc.—*Sc. Elliot* 4870; 5433.
16. **S. macrocarpa** *Welw.*—F.T.A. 1: 373; Loes l.c. 166, excl. vars. *latifolia*, *angustifolia*, and *grandiflora* Loes.; Chev. Bot. 134.
Ivory Coast: Upper Nuon Basin (Apr.). S. Nigeria: Old Calabar! Also in French Cameroons and Angola. Exsicc.—*Thomson* 93. *Chev.* 21109.
17. **S. Dalzielii** *Hutch. & M. B. Moss* in Kew Bull. 1928, ined. Scandent shrub.
N. Nigeria: Lokoja (Feb.)! S. Nigeria: Ezi (Feb.)! Exsicc.—*Dalziel* 92. *Thomas* 2328; 2358.
18. **S. chlorantha** *Oliv.*—F.T.A. 1: 375; Loes. l.c. 168. A twining shrub with green fragrant flowers.
N. Nigeria: Nupe! Exsicc.—*Barter* 1658.
19. **S. cornifolia** *Hook. f.*—F.T.A. 1: 375, excl. var. *crassisepala* Oliv.; Loes l.c. 185. *S. Baumannii* Loes.; Chev. Bot. 133. A woody scrambling and climbing shrub.
Sierra Leone: Talla Hills (Feb.)! Limba! Sendugu (June)! Yetaya (Sept.)! Sugarloaf Mt.! Liberia: Grand Bassa! Dahomey! S. Nigeria: Lagos (Apr.)! Also in Gabon. Exsicc.—*Afzelius. Sc. Elliot* 4825; 5575. *Thomas* 680; 2439. *Vogel* 90; 118. *Dalz.* 1067; 1153. (See Appendix).
20. **S. Gilgiana** *Loes.* l.c. 168.
S. Nigeria: Johann-Albrechtshöhe, on lake shore (Feb.)! Exsicc.—*Staudt* 591.
21. **S. pyriformis** *Walp.*—F.T.A. 1: 374, excl. var. *obtusa* Oliv.; Loes. l.c. 179; Chev. Bot. 135. A tree 25 ft. high.
Senegal! Sierra Leone: Kumrabai (Dec.)! Moria (Feb.)! Liberia: Du River (Aug.)! S. Nigeria: Calabar (Feb.)! Oban! Cameroons R. (Jan.)! Exsicc.—*Heudelot* 798. *Thomas* 7012. *Sc. Elliot* 3946: 4843. *Don. Mann* 2221; 2291. *Linder* 253.
22. **S. alpestris** *A. Chev.* Bot. 133. A shrub up to 6 ft. high.
French Guinea: Ditinn and Diaguissa (Apr.)! Sierra Leone: near Kambia (Dec.)! Exsicc.—*Chev.* 12859. *Sc. Elliot* 4359.
23. **S. rufescens** *Hook. f.*—F.T.A. 1: 377; Loes. l.c. 185. Branchlets with numerous lenticels.
Sierra Leone! Exsicc.—*Rositer. Thomas* 5197.
24. **S. erecta** *Walp.*—F.T.A. 1: 377; Loes. l.c. 168.
Sierra Leone: near Freetown! Rowalla (July)! Exsicc.—*Barter. Don. Thomas* 1010.
25. **S. pallescens** *Oliv.*—F.T.A. 1: 376 Loes. l.c. 185; Chev. Bot. 135. A shrub with small black-purple flowers.
Sierra Leone! N. Nigeria: Nupe! Abinsi (May)! S. Nigeria: Lagos. Exsicc.—*Barter. Dalz.* 650. *Chev.* 13988; 14035; 14046.
26. **S. Talbotii** *Bak. fil.* in Cat. Talb. Nig. Pl. 19. A shrub 10–15 ft. high.
S. Nigeria: Oban! Calabar (Feb.)! Exsicc.—*Talb.* 1359; 1705. *Mann* 2265.
27. **S. Preussii** *Loes.* in Engl. Bot. Jahrb. 19: 239, and l.c. 192.
S. Nigeria: Barombi! Johann-Albrechtshöhe! Also in French Cameroons. Exsicc.—*Preuss* 21. *Staudt* 935.
28. **S. fimbrisepala** *Loes.* l.c. 190.
Gold Coast: Kwahu, 2,000 ft. (Apr.)! Cameroons Mt.: Buea (Apr.)! Exsicc.—*Johnson* 648. *Lehmbach* 228.
29. **S. camerunensis** *Loes.* in Engl. Bot. Jahrb. 19: 240, and l.c. 176. A shrub with small yellowish flowers.
Liberia: Bakratown! Gold Coast! Togo: Kame R. (May)! S. Nigeria: Oban! Also in French Cameroons. Exsicc.—*Irvine* 390. *Baumann* 587. *Talb.* 405; 1512; 1589. *Linder* 864.
30. **S. Staudtiana** *Loes.* l.c. 187.
S. Nigeria: Johann-Albrechtshöhe! Also in French Cameroons. Exsicc.—*Staudt* 563; 631. We have not seen var. *leonensis* Loes. l.c. 188 (Sierra Leone: *Afzelius*; *Sc. Elliot* 4777).
31. **S. lucida** *Oliv.*—F.T.A. 1: 373; Loes. l.c. 165; Chev. Bot. 134.
Ivory Coast: S. Nigeria: Calabar! Exsicc.—*Thomson* 102.
32. **S. bipindensis** *Loes.* l.c. 188; Chev. Bot. 133. *S. cornifolia* var. *crassisepala* Oliv.—F.T.A. 1: 375.
Sierra Leone: Ninia (Feb.)! Kurusu (Apr.)! Liberia (*fide* Engl.). Ivory Coast: Agniéby Valley (Feb.)! Gold Coast: Bakanta (Aug.)! S. Nigeria: Oban! Calabar (Feb.)! Also in French Cameroons. Exsicc.—*Sc. Elliot* 4930; 5638. *Chipp* 316. *Talb.* 1668. *Mann* 2275. *Chev.* 17039, etc.
33. **S. leonensis** *Hutch. & M. B. Moss* in Kew Bull. 1928, ined. Branchlets very closely warted.
Sierra Leone: various localities! Liberia: original forest at Peahtah! Exsicc.—*Unwin & Smythe* 16. *Aylmer* 82. *Thomas* 7650; 7944; 9360. *Linder* 906.
34. **S. Johannis-Albrechtii** *Loes.* in Engl. Bot. Jahrb. 41: 281. A shrub with obscurely quadrangular branchlets.
S. Nigeria: between Mundame and Johann-Albrechtshöhe (Dec.). Exsicc.—*Winkler* 1033.
35. **S. Whytei** *Loes.* l.c. 184.
Sierra Leone! Liberia: near Monrovia! Gold Coast: E. Akim (June)! Exsicc.—*Rositer* 60. *Whyte. Johnson* 761.
36. **S. Caillei** *A. Chev.* ex *Hutch. & M. B. Moss* in Kew Bull. 1928, ined.
French Guinea: Kouria (Sept.)! Sierra Leone: various localities! Liberia: Banga! Gold Coast: Klobo (July)! Exsicc.—*Chev.* 14902. *Thomas* 1071; 3730; 9016. *Johnson* 1107. *Linder* 1241.
37. **S. nitida** *N. E. Br.*—F.T.A. 4: 415; Loes. l.c. 196; Chev. Bot. 135. *Gymnema nitidum* Benth.
French Guinea: near Kouria (Aug.)! Sierra Leone: Yonibana (Nov.)! Liberia: Cape Palmas! Exsicc.—*Thomas* 4764; 5008. *Ansell. Chev.* 14626; 14902.
38. **S. Howesii** *Hutch. & M. B. Moss* in Kew Bull. 1928, ined. Small shrub, rare; flowers greenish.
Gold Coast: Anaje, 7 miles north-west of Sekondi (Oct.)! Exsicc.—*Howes* 974.

Imperfectly known species.

S. denudata *A. Chev.* Bot. 133.
Ivory Coast: Agniéby Valley (fr. Jan.)! between the Middle Sassandra and the Middle Cavally (fr. July)! between Ganhoué and Bampleu (Apr.)! Exsicc.—*Chev.* 17100; 19278; 21165.—We are unable to place this species in the key because of the absence of leaves and flowers.

92. ICACINACEAE

Trees, shrubs or rarely climbers. Leaves alternate or rarely opposite, simple; stipules absent. Flowers hermaphrodite or rarely unisexual, actinomorphic. Calyx small, 4–5-lobed; lobes imbricate or valvate, rarely enlarging and enveloping the fruit. Petals 4–5, free or united, valvate, rarely absent. Stamens the same number as the petals and alternate with them; anthers 2-celled; filaments often hairy, free. Disk rarely present. Ovary superior,

1-celled, 1-seeded. Seeds mostly with endosperm ; embryo usually small, more or less straight.

A small tropical family with a tendency to a gamopetalous corolla ; petals valvate ; petals inside or anthers sometimes hairy.

Leaves alternate :
Flowers hermaphrodite :
Inflorescence axillary or terminal or slightly supra-axillary (not extra-axillary) :
Inflorescence on the young shoots :
Inflorescence a very long slender spike .. .. 1. **Desmostachys**
Inflorescence cymose :
Petals bearded inside ; fruits tomentose .. .. 2. **Icacina**
Petals glabrous inside ; fruits reticulate .. .. .. 3. **Alsodeiopsis**
Inflorescence fasciculate ; fruits slightly bilobed, reticulate .. 4. **Rhaphiostylis**
Inflorescence on the old wood ; petals free, glabrous inside .. 5. **Lavigeria**
Inflorescence extra-axillary :
Inflorescence leaf-opposed ; anthers densely villous ; petals free 6. **Lasianthera**
Infloresence not leaf-opposed ; petals united into a slender tube .. 7. **Leptaulus**
Flowers unisexual :
Corolla absent ; fruit not enveloped .. .. 8. **Pyrenacantha**
Corolla present, enlarging and completely enveloping the fruit .. 9. **Chlamydocarya**
Leaves opposite ; flowers dioecious in loose cymes ; climber with extra-axillary tendrils 10. **Iodes**

1. DESMOSTACHYS Planch.—F.T.A. 1 : 353.

Flowers 3–4 mm. long ; inflorescence almost filiform, very long, the rhachis flattened and hairy at the sides only ; leaves oblong to obovate, caudate-acuminate, up to 20 cm. long and 10 cm. broad, glabrous, laxly reticulate .. 1. *tenuifolius*
Flowers about 8 mm. long ; leaves oblong ; other characters as above but rhachis of inflorescence stouter and hairy all round .. .. 2. *Vogelii*

1. **D. tenuifolius** *Oliv.*—F.T.A. 1 : 353 ; Chev. Bot. 126. A shrub or small tree up to 30 ft. high, more or less glabrous, with small white flowers in long very slender pendulous spikes.
Sierra Leone ! Dahomey : Savalou, between Cabolé and Bassila ! S. Nigeria : Eket ! Oban ! Calabar (July) ! Fernando Po (June) ! Exsicc. —*Barter* (no numbers). *Mann* 421. *Holland* 63. *Talb.* 21 ; 100. *Robb.*
2. **D. Vogelii** *Stapf* in Johnston, Liberia 2 : 587 ; Chev. Bot. 126. *Sarcostigma Vogelii* Miers. A glabrous climbing shrub resembling the last ; fruit a red drupe.
Liberia : Cape Palmas (July) ! Kakatown ! Totokwelli, Medina (Oct.) ! Moala ! Bumbuma ! Ivory Coast : Cavally Basin, Grabo (July) ! Between Tabon and Bériby, near the sea (Aug.) ! Exsicc.—*T. Vogel* 25 ; 27 ; 68. *Linder* 1304 ; 1345 ; 1377.

2. ICACINA A. Juss.—F.T.A. 1 : 356.

Flowers in lax terminal corymbose cymes ; leaves ovate to obovate, obtusely acuminate to rounded and emarginate, 5–12 cm. long, 4–7 cm. broad, conspicuously reticulate and glabrous or nearly so ; calyx short ; petals shortly hairy outside ; fruits obovoid, 3 cm. long, tomentellous, slightly wrinkled when dry .. .. 1. *senegalensis*
Flowers in axillary clusters or short dense cymes :
Flowers rather lax and pedicellate ; leaves broadly obovate-elliptic, abruptly acuminate, more or less cuneate at the base, up to 20 cm. long and 12 cm. broad, glabrescent below ; calyx much shorter than the petals ; petals appressed-tomentellous outside 2. *Mannii*
Flowers densely crowded and subsessile ; leaves broadly elliptic, abruptly acute, rounded at the base, 10–20 cm. long, up to 14 cm. broad, thinly stellate-pilose below ; calyx nearly as long as the petals ; petals villous outside ; fruits ellipsoid-globose, 2·5 cm. long, tomentose .. .. 3. *trichantha*

1. **I. senegalensis** *A. Juss.*—F.T.A. 1 : 357 ; Chev. Bot. 128. An undershrub, throwing out glabrous or pubescent leafy shoots 2–3 ft. high from an enormous underground fleshy rhizome ; flowers whitish ; berries reddish.
Senegal : Kaolak, etc. ! Casamance ! Gambia : very common ! French Guinea : Labé ; locality ? ! Gold Coast : abundant in the Northern Territories and N. Ashanti ! Dahomey : between Agouagon and Savé ; Savalou ; Gouka. N. Nigeria : Benue R. ! S. Nigeria : ? locality ! Also in Upper Ubangi-Shari region. Exsicc.—*Heudelot. Barter* 3422. *Skues. Brown-Lester* 35 ; 49. *Ozanne* 6. *Farmar* 309. *Dalz.* 34. *Poboguin* 2142. (See Appendix).
2. **I. Mannii** *Oliv.*—F.T.A. 1 : 357. A shrub 8 ft. high, sometimes more or less scandent, glabrous, from a large tuberous root 9–12 in. in diameter.
S. Nigeria : Calabar (Feb.) ! Okpanam ! Extends south to Gabon and Congo. Exsicc.- *Mann* 2241. *Kitson.*
3. **I. trichantha** *Oliv.*—F.T.A. 1 : 358. A scandent shrub with tomentose branchlets and inflorescence ; fruits red, velvety.
S. Nigeria : Lagos Colony ! Lagos, Ikoyi (fl. and fr. Jan., fr. Oct.) ! Onitsha ! Exsicc.—*Barter* 1793. *Rowland. Dalz.* 1094 ; 1398. (See Appendix).

3. ALSODEIOPSIS Oliv.—F.T.A. 1 : 356.

Leaves pubescent below :
Branchlets and lower surface of the leaves pilose with rather long spreading hairs ; leaves oblong-obovate, acutely acuminate, subcordate and very unequal-sided at the base, 7–10 cm. long, 3–5 cm. broad, with about 6 pairs of prominent lateral nerves below ; flowers very few on a short peduncle ; sepals subulate ; petals lanceolate, 4 mm. long, pubescent outside ; fruit ellipsoid, 1 cm. long, reticulate 1. *Chippii*
Branchlets and leaves pubescent with very short appressed hairs :
Leaves small, up to 8 cm. long and 5 cm. broad, subcordate and very unequal-sided at the base, broadly acuminate and mucronate at the apex, the lateral nerves with small pocket-like structures in the axils ; flowers few, subumbellate on short axillary peduncles ; fruits narrowly ovoid, 1–1·5 cm. long, reticulate 2. *Staudtii*
Leaves larger, over 10 cm. long and 5 cm. broad, rather narrowed to the base, acutely caudate-acuminate ; flowers rather numerous, subumbellate on axillary peduncles about 2·5 cm. long ; petals 3·5 mm. long ; fruits 2 cm. long, reticulate, minutely pubescent .. .. 3. *Rowlandii*
Leaves glabrous below, broadly elliptic, rather gradually and broadly acuminate, 10–16 cm. long, 6–8 cm. broad, thin, with about 5 pairs of lateral nerves ; flowers not seen 4. *glaberrima*

1. **A. Chippii** *Hutch.* in Kew Bull. 1912 : 224. A yellow-flowered shrub.
Gold Coast : Axim ! Dompem, Atisslabo (Dec.) ! Exsicc.—*Chipp* 46. *Burton & Cameron.*
2. **A. Staudtii** *Engl.* Bot. Jahrb. 24 : 479. *A. Weissenhorniana* A. Chev. Bot. 128, not of Braun & K. Schum. A shrub or small tree with yellow flowers and red fruit.
Ivory Coast : various localities ! Gold Coast : near Essuasu, W. Prov. (fr. May). S. Nigeria : Ibadan ! Also in French Cameroons and south to Congo. Exsicc.—*Chipp* 215. *Vigne* 963. *Schlechter* 13011. *Chev.* 16374 ; 16418 ; 17410.
3. **A. Rowlandii** *Engl.* Bot. Jahrb. 24 : 479. A shrub with small yellowish flowers.
S. Nigeria : Lagos Colony (Aug.) ! Eket ! Degema ! Exsicc.—*Rowland. Talb.* 3354.
4. **A. glaberrima** *Engl.* ms. A shrub with greenish glabrous slightly ribbed branchlets.
S. Nigeria : Barombi ! Exsicc.—*Preuss* 352.

4. RHAPHIOSTYLIS Planch.—F.T.A. 1 : 355 (under *Apodytes*) ; Engl. Bot. Jahrb. 43 : 180.

Leaves not cordate :
Ovary glabrous ; pedicels and corolla glabrous ; leaves oblong-elliptic, obtusely acuminate, 10–15 cm. long, 4–6 cm. broad, glabrous, the lower lateral nerves ascending ; flowers rather numerous in axillary fascicles ; pedicels 7–8 mm. long ; fruits subdidymous, quadrate, 1–1·5 cm. broad, reticulate .. .. 1. *beninensis*
Ovary tomentose all over or at the top :
Pedicels and corolla glabrous ; leaves elliptic, rather abruptly acuminate, 6–9 cm. long, 2·5–4 cm. broad, glabrous :
Lateral nerves ascending ; flowers numerous ; pedicels 3–4 mm. long 2. *Preussii*
Lateral nerves spreading ; pedicels 1 cm. long .. .. 3. *Poggei*
Pedicels and corolla pubescent ; leaves oblong, subacutely acuminate, 9–12 cm. long, 3–4 cm. broad, glabrous, the lateral nerves spreading ; flowers few ; pedicels 2–4 mm. long ; fruit 2·5 cm. broad, coarsely verrucose .. .. 4. *ferruginea*
Leaves cordate at the base, ovate-elliptic, long- and obtusely acuminate, 9–12 cm. long, 5–6 cm. broad, pilose below especially on the nerves, with 3–4 pairs of lateral nerves ; petiole 3–4 mm. long, villous ; flowers in sessile axillary clusters ; sepals setulose ; petals 8 mm. long, slightly setose at the apex ; ovary villous .. .. 5. *cordifolia*

1. **R. beninensis** *Planch.* ex *Benth.* in Hook. Nig. Fl. 259. *Apodytes beninensis* Hook. f. Ic. Pl. t. 778—F.T.A. 1 : 355, excl. var. β ; Stapf 587 ; Chev. Bot. 127. *R. Heudelotii* Planch. A glabrous shrub up to 15 ft. high, sometimes with climbing and twining branches, with whitish flowers and smooth red fleshy fruits sometimes bilobed or kidney-shaped.
Common from Senegal to S. Nigeria, and south to Congo and N. Angola. Exsicc.—*Heudelot* 723. *T. Vogel* 46. *Sc. Elliot* 4485 ; 4711 ; 5419. *Millen* 22 ; 170. *Johnson* 825 ; 881. *Farmar* 300. *Chev.* 12389 ; 14890. *Warnecke* 407 ; 475.
2. **R. Preussii** *Engl.* Bot. Jahrb. 17 : 72. A tree about 30 ft. high with flexuous branchlets and whitish flowers in axillary clusters.
S. Nigeria : Barombi ! Exsicc.—*Preuss* 522.
3. **R. Poggei** *Engl.* l.c. 73.
S. Nigeria : Barombi ! Exsicc.—*Preuss* 561 (not seen).
4. **R. ferruginea** *Engl.* l.c. 43 : 181. *Apodytes beninensis* var. β Oliv.—F.T.A. 1 : 356. *Icacina sarmentosa* A. Chev. Bot. 127. A shrub like *R. beninensis*, often climbing.
Ivory Coast : Yapo, in forest (Oct.) ! S. Nigeria : Epe ! Also in French Cameroons and Gabon. Exsicc. —*Barter* 3286. *Chev.* 22373.
5. **R. cordifolia** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. Vine climbing over tree in primitive forest ; flowers cream.
Liberia : Banga (Oct.) ! Exsicc.—*Linder* 1218.

5. LAVIGERIA Pierre Fl. For. Cochinch. Fasc. 17, sub t. 267 (1892).

Leaves oblong-elliptic, shortly pointed, rounded at the base, 15–25 cm. long, 7–11 cm. broad, slightly stellate-pubescent below, coarsely reticulate ; panicles clustered on

the main stem, tomentellous ; flowers very small, sessile ; petals nearly glabrous outside, not hairy inside ; fruit ovoid, about 7 cm. long, corrugated .. *macrocarpa*

Lavigeria macrocarpa *Pierre* l.c. *Icacina macrocarpa* Oliv.—F.T.A. 1 : 357. *Lavigeria salutaris* Pierre. An extensive woody climber with pubescent branchlets.
S. Nigeria : Cross River (Dec.) ! Fernando Po (Dec.) ! Extends to Gabon. Exsicc.—*Barter* 43. *Holland* 184.

6. LASIANTHERA P. de Beauv.—F.T.A. 1 : 353.

Branchlets terete and slightly ridged, glabrous ; leaves oblong-elliptic, long-caudate-acuminate, shortly cuneate at the base, 8–15 cm. long, 3–6 cm. broad, glabrous ; lateral nerves about 6 pairs, looped ; cymes leaf-opposed, small, the flowers in small partial heads ; petals 3 mm. long ; anthers densely villous ; fruits oblong-elliptic, flattened, beaked, about 1 cm. long, longitudinally ribbed .. .. *africana*

L. africana *P. de Beauv.* Fl. Owar. t. 51—F.T.A. 1 : 353. A glabrous shrub, 10–12 ft., with terete branchlets and small white flowers in umbellate head-like clusters.
Gold Coast : Chama. S. Nigeria : Oban ! Calabar ! Barombi ! Johann-Albrechtshöhe ! Fernando Po (Dec.) ! Also in French Cameroons, Spanish Guinea and Gabon.

7. LEPTAULUS Benth.—F.T.A. 1 : 354.

Flowers numerous in each extra-axillary cluster, about 1 cm. long ; leaves oblong-elliptic, broadly and obtusely acuminate, 8–12 cm. long, 3·5–6 cm. broad, glabrous, bright green ; pedicels 2–3 mm. long ; style glabrous ; fruit pointed, 2·5–4 cm. long, with persistent calyx .. .. 1. *daphnoides*

Flowers subsolitary and shortly pedicellate or subsessile ; other characters more or less as above, but acumen subspathulate and style pubescent ; fruit oblong-elliptic, narrowed at each end .. .. 2. *Zenkeri*

1. **L. daphnoides** *Benth.*—F.T.A. 1 : 354 ; Ic. Pl. 2339 ; Stapf 588 ; Chev. Bot. 127. A shrub or small tree up to 25 ft. high, with glabrous greenish branchlets, subcoriaceous leaves and white tubular fragrant flowers.
Sierra Leone : fairly common (Mar.–May) ! Liberia : Kakatown ! Sino Basin ! Du River ! Gbanga ! Bonuta ! Brewer's Landing ! Ivory Coast : Malamalasso, on the Lower Comoé ! Soubré, on the Sassandra ! Gold Coast : Asanafos ! S. Nigeria : Oban ! Barombi ! Johann-Albrechtshöhe ! Extends to E. Sudan, Uganda, Gabon and Congo. Exsicc.—*Barter* 806. *Sc. Elliot* 5417 ; 5562. *Whyte. Preuss* 1356. *Staudt* 547. *Linder* 248 ; 643 ; 873 ; 1403.
2. **L. Zenkeri** *Engl.* Bot. Jahrb. 43 : 179. A shrub or small tree with flexuous branchlets.
S. Nigeria : Oban ! Also in French Cameroons, Gabon and Congo. Exsicc.—*Talb.* 1410 ; 3322.

8. PYRENACANTHA Wight in Hook. Bot. Misc. 2 : 107 (1831).

Branchlets puberulous ; leaves oblong to elliptic, triangular-acuminate, rounded at the base, 7–16 cm. long, 4–7 cm. broad, denticulate, shortly pubescent below and strongly reticulate ; lateral nerves about 5 pairs ; petiole about 2 cm. long ; male inflorescences catkin-like, clustered, axillary, 3–4 cm. long, tomentellous ; sepals 4, ovate-lanceolate, pubescent ; stamens 4 ; fruits obovoid, 1·3 cm. long, tomentose ; seeds with very intrusive peg-like processes from the testa .. .. 1. *Staudtii*

Branchlets glabrous ; leaves oblong, auriculate-lobulate at the base, acuminate, 9–15 cm. long, 3–4 cm. broad, closely reticulate on both surfaces ; flowers not seen ; fruits broadly ovoid, long-beaked, 2 cm. long, glabrous .. .. .. 2. *Vogeliana*

1. **P. Staudtii** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Chlamydocarya Staudtii* Engl. Bot. Jahrb. 24 : 486, t. 8 A–D. A climbing shrub, rusty-yellowish pubescent on the young parts ; petioles of the leaves twisted.
S. Nigeria : Eket ! Degema ! Johann-Albrechtshöhe (Jan.) ! Also in French Cameroons and Belgian Congo. Exsicc.—*Thompson* 511. *Talb.* (no numbers). *Staudt* 568 ; 787.
2. **P. Vogeliana** *Baill.* Adansonia 10 : 271 ; Chev. Bot. 128. *Adelanthus Vogeliana* Baill. *P. Dinklagei* Engl. A slender twiner ; fruit a red drupe, pitted and reticulate.
Liberia : Grand Bassa (fr. May, July) ! Ivory Coast : various localities ! Also in French Cameroons. Exsicc.—*T. Vogel* 13. *Dinklage* 1929. *Chev.* 15373 ; 16961 ; 19047 ; 19814 ; 21155 ; 21156 ; 21511 ; 21624.

9. CHLAMYDOCARYA Baill. Adansonia 10 : 276 (1872).

Leaves glabrous below, elliptic, broadly acuminate and mucronate, about 16 cm. long and 7 cm. broad, entire, laxly reticulate below, with about 8–10 pairs of lateral nerves ; fruits enclosed by the elongated corolla about 4 cm. beyond the fruit body 1. *macrocarpa*

Leaves long-pilose on the nerves or tomentose below :

Leaves denticulate with fairly numerous teeth, oblong to obovate-elliptic, broadly acuminate, 10–16 cm. long, 4–8 cm. broad, long-pilose on the nerves on each side, male inflorescences catkin-like, 3·5 cm. long ; peduncle about as long, densely pilose ; fruits enclosed by the corolla, which elongates into a tube about 6 cm. long beyond the fruit .. .. 2. *Thomsoniana*

Leaves with very few teeth or trilobed, up to 15 cm. long and 10 cm. broad, tomentellous all over the lower surface ; male and female flowers capitate ; fruits enclosed by the enlarged persistent villous ovoid perianth slightly produced (1 cm.) beyond the fruit .. .. 3. *capitata*

1. **C. macrocarpa** *A. Chev.* Bot. 128, name only. Climber 9–12 ft., with yellowish fruits.
Ivory Coast : Dabou (Feb.) ! Exsicc.—*Chev.* 17216.
2. **C. Thomsoniana** *Baill.* Adansonia 10 : 276. A woody climber with more or less bristly stems.
S. Nigeria : Calabar ! Oban ! Also in French Cameroons. Exsicc.—*Thomson* 12. *Talb.* 1422.

3. **C. capitata** *Baill.* l.c. 277; Chev. Bot. 128. A woody twiner, hirsute with rusty-yellow hairs; flowers whitish: fruit red.
French Guinea: Guerzé country, foot of Mt. Nzo (Mar.)! In forest near Kaoulendougou (Mar.)! Sierra Leone: Freetown (fr. Jan., Mar.)! Jepihun! Fundu-Furudugu! Mabonto (Oct.)! Yungeru (Jan.)! Liberia: Peahtah! Exsicc.—*Kirk* 35. *Smythe* 90; 217; 231. *Dalz.* 986. *Thomas* 3509; 7368. *Linder* 1076.

10. IODES Blume—F.T.A. 1 : 358.

Leaves densely tomentose below, broadly ovate-elliptic, acutely and abruptly acuminate, rounded at the base, 10–15 cm. long, 6–8 cm. broad, glabrous above; lateral nerves about 6 pairs; cymes axillary, about 6 cm. long, tomentellous; fruits broadly ovoid, 1·3 cm. long, coarsely reticulate, thinly tomentellous .. .. 1. *kamerunensis*
Leaves thinly pilose or nearly glabrous below:
Branchlets and leaves thinly pilose with long weak hairs; leaves ovate, shortly acuminate, cordate at the base, 5–9 cm. long, with prominent nerves below; cymes short, pilose; fruits broadly ellipsoid, 1·3 cm. long, coarsely reticulate and tomentellous .. .. 2. *Talbotii*
Branchlets very shortly pubescent or glabrescent; leaves glabrous:
Leaves not shining, very laxly reticulate, broadly ovate or ovate-rounded, abruptly acuminate, rounded or subcordate at the base, 9–15 cm. long, up to 11 cm. broad; fruits broadly ovoid-ellipsoid, 8 mm. long, reticulate, glabrous .. 3. *africana*
Leaves shining and closely reticulate, otherwise as in preceding .. 4. *liberica*

1. **I. kamerunensis** *Engl.* Bot. Jahrb. 24 : 481. A climber with tendrils, covered with yellow-rusty tomentum.
S. Nigeria: Johann-Albrechtshöhe (Jan.)! Also in French Cameroons. Exsicc.—*Staudt* 557.
2. **I. Talbotii** *Bak. f.* ex *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A climber with tendrils, spreadingly yellow-hairy.
S. Nigeria: Oban! Exsicc.—*Talb.* 572.
3. **I. africana** *Welw.*—F.T.A. 1 : 358. A weak climber with tendrils and small flowers in irregularly forked cymose panicles.
S. Nigeria: Calabar River (Feb.)! Oban! Extends south to Angola. Exsicc.—*Mann* 2322. *Talb.* 1578.
4. **I. liberica** *Stapf* in Johnston Liberia 2 : 588; Chev. Bot. 129. *I. reticulata* Stapf, not of King. A slender climbing shrub with yellowish downy branchlets and tendrils, yellow flowers and red fruits.
French Guinea: Toma country, between Berezia and Diorogougou. Liberia: Kakatown! Sino Basin! Banga (Oct.)! Ivory Coast: various localities. Exsicc.—*Whyte. Linder* 1163.

93. SALVADORACEAE

Trees or shrubs, sometimes with axillary spines. Leaves opposite, simple; stipules minute. Flowers in dense axillary fascicles or panicles, hermaphrodite or dioecious, actinomorphic. Calyx 3–4-toothed. Petals 4, free or shortly united, imbricate. Stamens 4, inserted on or near the base of the petals and alternate with them; anthers 2-celled, opening lengthwise. Disk absent or of separate glands. Ovary superior, 1–2-celled; style short. Ovules 1–2, erect. Fruit a berry or drupe. Seed erect, without endosperm; embryo with thick cordate cotyledons.

A small family mainly in tropical Africa and the Mascarene Islands.

SALVADORA Linn.—F.T.A. 4, 1 : 23.

Leaves opposite, entire; flowers small, subunisexual, paniculate; petals 4, united into a short tube; stamens 4; ovary 1-celled; ovule 1, basal, erect.

Branches light greyish green, glabrous; leaves lanceolate to elliptic, mucronate, rounded to subacute at the base, 3–7 cm. long, 1·5–3 cm. broad, rigidly chartaceous, grey when dry, glabrous, the few lateral nerves equally prominent on both sides; petiole nearly 1 cm. long; panicles divaricate, lax; calyx shallowly lobed; petals 1·5 mm. long; berry subglobose, about 6 mm. diam. .. .. .. *persica*

S. persica *Linn.*—F.T.A. 4, 1 : 23; Chev. Bot. 399.
Mauritania! Senegal: Richard Tol! French Sudan: various localities! N. Nigeria: shores of Lake Chad! Bornu! Extends throughout tropical Africa and Arabia to India. Exsicc.—*Döllinger* 75. *Elliott* 146. *Vogel. Foster* 94. (See Appendix).

94. OLACACEAE

Trees, shrubs or climbers. Leaves alternate, simple; stipules absent. Flowers actinomorphic, usually hermaphrodite and small. Calyx-lobes imbricate or open in bud. Petals free or variously connate, valvate. Disk often present, usually annular. Stamens free or rarely united into a column, the same number as and opposite the petals or fewer or more numerous, some often without anthers; anthers 2-celled, opening by slits or pore-like slits. Ovary superior or slightly

immersed in the disk, 1–3-celled ; style 1, with a 2–5-lobed stigma ; ovules 1–5 from the apex of a central placenta in the 1-celled ovaries, or pendulous from the inner angle of the 2- or more-celled. Fruit drupaceous, sometimes inferior by concrescence with the calyx. Seeds with copious endosperm and small or medium-sized straight embryo.

Confined to the tropics and subtropics.

Stamens free from each other :
Ovary and fruit superior :
Flowers few in axillary fascicles ; calyx much enlarged in fruit and deeply lobed **1. Heisteria**
Flowers subumbellate ; branchlets usually armed with spines ; petals densely villous inside ; sepals and petals 4 .. .. **2. Ximenia**
Flowers in axillary panicles or small racemes ; calyx a mere rim, sometimes enlarged in fruit :
Flowers paniculate ; lateral nerves of leaves continued to the margin **3. Coula**
Flowers in small racemes ; lateral nerves of leaves much looped within the margin :
Calyx obvious, sometimes enlarged and enclosing the fruit. .. .. **4. Olax**
Calyx obsolete, never enlarged .. .. **5. Ptychopetalum**
Ovary and fruit inferior ; flowers in axillary fascicles ; sepals 5, not enlarged in fruit ; petals hairy inside ; branchlets not spiny .. .. .. **6. Strombosia**
Stamens united into a column ; calyx enlarged in fruit :
Calyx not splitting, much expanded in fruit .. .. **7. Aptandra**
Calyx splitting into 3 segments, at first enveloping the fruit, not expanded **8. Ongokea**

1. HEISTERIA Linn.—F.T.A. 1 : 345.

Branchlets narrowly winged, glabrous ; leaves more or less oblong, obtusely caudate-acuminate, 8–12 cm. long, 3–6 cm. broad, glabrous, with about 6 pairs of lateral nerves and very laxly reticulate tertiary nerves ; flowers at first very small, 2–3, axillary, very shortly pedicellate, usually only one developing into fruit, with the calyx much enlarged and divided nearly to the base into 5 more or less ovate spreading segments ; fruits broadly ellipsoid to globose, 1·3–2 cm. long, glabrous **1. *parvifolia***

Branchlets, etc., as above, but calyx very broad in fruit and very shortly lobed, broader than long .. .. **2. *Zimmereri***

1. **H. parvifolia** *Smith*—F.T.A. 1 : 346; Engl. Pflanzenw. Afr. 3, 1 : 85, fig. 49 ; Stapf 586 ; Chev. Bot. 123. *H. Winkleri* Engl. A glabrous shrub or small tree up to 30 ft. high, with small greenish-white flowers but with the calyx enlarged, persistent deep red, and a greyish-white fruit.
Common from Senegal and French Guinea to French Cameroons and extending to the Congo. Exsicc.—*Heudelot* 672. *Don. Whitfield. T. Vogel* 86 ; 135. *Moloney. Rowland. Millson* 103. *Sc. Elliot* 4208 ; 4805 ; 5111. *Cummins* 105. *Johnson* 889. *Whyte. Dinklage* 1670. *Preuss* 7 ; 1252. *Schlechter* 12401. *Linder* 9 ; 51 ; 96 ; 845 ; 1178 ; 1534. (See Appendix).
2. **H. Zimmereri** *Engl.* Notizbl. Bot. Gart. Berl. 2 : 288 and Pflanzenw. Afr. 3, 1 : 85, fig. 50. A small spreading tree.
S. Nigeria : Barombi ! Also in French Cameroons and Gabon. Exsicc.—*Preuss* 274.

2. XIMENIA Linn.—F.T.A. 1 : 346.

Branchlets often armed with rigid axillary spines, flexuous ; leaves narrowly elliptic, emarginate, 3–7 cm. long, up to 3 cm. broad, glabrous, obscurely nerved ; flowers in axillary umbellate racemes ; pedicels about 5 mm. long ; sepals 4, ovate-triangular ; petals 4, oblong-linear, bearded inside ; fruit superior, ellipsoid, about 3 cm. long, glabrous .. .. *americana*

X. americana *Linn.*—F.T.A. 1 : 346 ; Engl. Pflanzenw. Afr. 3, 1 : 82, fig. 46 ; Holl. 1 : 157 ; Chev. Bot. 123. A glabrous shrub or small tree, with white fragrant flowers and a yellow plum-like fruit.
A common shrub chiefly of the savannah regions but also near the coast, extending to East and S. Africa, and also in tropical America. Exsicc.—*Heudelot. Barter* 3409. *Mann* 764. *Sc. Elliot* 5117 ; 5237. *Johnson* 539. *Warnecke* 234. *Mildbr.* 7498. (See Appendix).

3. COULA Baill.—F.T.A. 1 : 351.

Leaves elliptic to elongate-oblong-elliptic, long-caudate-acuminate, shortly cuneate at the base, up to 30 cm. long and 9 cm. broad, papery, often rust-coloured, laxly gland-dotted below, with up to 14 pairs of lateral nerves and numerous faint forked parallel tertiary nerves ; petiole up to 2·5 cm. long, rusty-puberulous ; flowers in short rusty-puberulous panicles ; calyx rim-like ; petals small, thick, valvate, becoming glabrous ; fruits ellipsoid-globose, 4 cm. long, with a woody shell about 6 mm. thick, smooth *edulis*

C. edulis *Baill.*—F.T.A. 1 : 351 ; Engl. Pflanzenw. Afr. 3, 1 : 87, fig. 51 ; Stapf 587 ; Holl. 1 : 159. A tree up to 50–60 ft. high, rusty-pubescent on the young parts, with coriaceous leaves and walnut-like fruits.
Sierra Leone : Kambui Reserve, between Hangha and Bumbu ! Liberia and Ivory Coast, common ! Gold Coast : Tanosu (Jan.) ! Apollonia ! S. Nigeria : Degema (Oct.) ! Oban ! Extends to Gabon. Exsicc.—*Lane-Poole* 351. *Chipp* 361. *Brent* 2 DD. *King-Church* 44. *Talb.* (no numbers). (See Appendix).

4. OLAX Linn.—F.T.A. 1 : 348.

Leaves lanceolate or oblong-lanceolate, gradually acuminate, mostly cuneate at the base, usually about 2–2·5 cm. (rarely up to 3·5 cm.) broad ; branchlets flexuous, markedly angular ; flowers on numerous short lateral sometimes leafy branchlets ; flower-bud 5–6 mm. long, not constricted in the middle ; fruits depressed-globose, about 1·5 cm. diam., with the saucer-like calyx only slightly enlarged and splitting 1. *subscorpioidea*

Leaves mostly ovate to elliptic or broadly oblong-elliptic, usually well over 4 cm. broad, usually more or less abruptly acuminate ; flowers in short axillary never leafy racemes ; calyx sometimes enlarged and enclosing the fruit :

Corolla-bud on opening at least 3 times as long as broad, more or less cylindrical with a slightly broader limb :

Leaves more or less narrowly oblong-elliptic, rather cuneate at the base and gradually

FIG. 161.—XIMENIA AMERICANA *Linn.* (OLACACEAE).
A, inflorescence. B, flower. C, same in vertical section. D, stamen. E, cross section of ovary. F, fruit.

acuminate, up to 12 cm. long and 5 cm. broad, with slightly impressed nerves ; flowers in very short racemes ; bracts broadly ovate ; fruits enclosed in the accrescent calyx .. .. 2. *Mannii*

Leaves very broadly elliptic, rounded to a shortly cuneate base and rather abruptly acuminate, 10–14 cm. long, 6–9 cm. broad, the nerves above deeply impressed ; flowers in very short racemes ; bracts ovate ; fruits completely enclosed in the accrescent calyx .. .. 3. *insculpta*

Corolla-bud short and thick, at most twice as long as broad, usually constricted in the middle :

Fruit completely surrounded by the accrescent calyx :

Leaves very broadly elliptic, rounded at the base, 10–15 cm. long, 7–10 cm. broad, with 6–8 pairs of lateral nerves ; fruits 1·5 cm. diam., depressed-globose, surrounded by the accrescent calyx .. .. 4. *latifolia*

Leaves more or less oblong-elliptic, shortly cuneate at the base, acutely long-acuminate, 12–15 cm. long, 4–6 cm. broad, with 5–6 pairs of looped lateral nerves ; fruits ovoid-globose, 1·5 cm. diam., surrounded by the accrescent calyx 5. *Zenkeri*

Fruit not surrounded by the calyx, the latter remaining quite small :

Leaves more or less oblong-elliptic, cuneate at the base, up to 15 cm. long and 6 cm. broad ; fruits small with a small unchanged calyx at the base .. 6. *viridis*

Leaves ovate or ovate-lanceolate, gradually acuminate, 10–12 cm. long, 3·5–5 cm. broad, thin, glabrous, rounded at the base; racemes about 2 cm. long; buds narrowly ovoid, 5 mm. long; fruits globose, 7 mm. diam., glabrous
7. *gambecola*

1. **Olax subscorpioidea** *Oliv.*—F.T.A. 1 : 350; Chev. Bot. 125. *O. Durandii* Engl. *O. Laurentiana* Engl. (*O. Laurentii*). *O. chariensis* A. Chev. *O. Kerstingii* Engl., name only. A shrub with glabrous green branchlets ribbed by decurrence of the leaves, and a stone-fruit, yellow, turning red.
Common from French Guinea to French Cameroons, and extending to the Congo. Exsicc.—*Barter* 1785. *Sc. Elliot* 4185; 4677. *Rowland* 16; 30. *Millen* 170. *Johnson* 546; 810. *Elliott* 214. *Talb.* 1353. (See Appendix).
2. **O. Mannii** *Oliv.*—F.T.A. 1 : 349, partly (as to Calabar specimen). *O. major* Stapf 587. *O. macrocalyx* Engl. *O. longiflora* Engl. A glabrous shrub with pale green leaves and branchlets and greenish-white flowers brownish in bud.
Sierra Leone: Njala (Jan.)! Blama (Dec.)! Liberia: Grand Bassa! Monrovia! S. Nigeria: Calabar (Feb.)! Oban! Cameroons River (Jan.)! Johann-Albrechtshöhe! Exsicc.—*Mann* 2201; 2284. *Whyte. Talb.* 1354. *Dalz.* 8038. *Deighton* 317. *Staudt* 904 (Herb. Berlin); 908. *Dinklage* 1740.
3. **O. insculpta** *Hutch.* in Kew Bull. 1917 : 231. A shrub (or sometimes a tree) like the last but with broader leaves with impressed nerves and larger flowers.
S. Nigeria: Oban! Cross River (fr. Feb.)! Obompa (fr. Jan.)! Johann-Albrechtshöhe! Exsicc.—*Talb.* 1334. *McLeod. Thomas* 2238. *Staudt* 508.
4. **O. latifolia** *Engl.* in Notizbl. Bot. Gart. Berl. 2 : 284. A shrub with sulcate green branchlets; fruit orange-red.
S. Nigeria: Johann-Albrechtshöhe (Nov.)! Also in French Cameroons. Exsicc.—*Staudt* 465; 904 (Herb. Kew).
5. **O. Zenkeri** *Engl.* l.c. 284. *O. Mannii* Oliv.—F.T.A. 1 : 349, partly (as to Sierra del Crystal specimen). A shrub like the preceding.
S. Nigeria: Oban! Also in French Cameroons and Gabon. Exsicc.—*Talb.* 1394.
6. **O. viridis** *Oliv.*—F.T.A. 1 : 349. *O. pyramidata* A. Chev. Bot. 124. A shrub up to about 10 ft. high; fruit red when ripe.
Sierra Leone: Talla, Surinuia (Apr.)! Liberia: Gbanga (Sept.)! Ivory Coast: common! S. Nigeria: Lagos, Ikoyi (Mar.)! Epe! Also in Angola. Exsicc.—*Barter* 3303. *Sc. Elliot* 5530. *Dalz.* 1365. *Linder* 763. *Chev.* 16936; 19342; 19374.
7. **O. gambecola** *Baill.*—F.T.A. 1 : 349. A shrub like the preceding.
French Sudan: Bignona (fr. Feb.)! Senegal (fr. Jan.)! Exsicc.—*Heudelot* 715. *Chev.* 3171.

5. PTYCHOPETALUM Benth.—F.T.A. 1 : 347.

Flower-buds very acute, about 7 mm. long; fruits ellipsoid, 1·3 cm. long, minutely verruculose; leaves sessile, oblong-elliptic, acuminate, 6–10 cm. long, 2·5–3·5 cm. broad, with distinct looped lateral nerves; branchlets winged; bracts large and apiculate, enclosing the flower-buds .. .. 1. *anceps*

Flower-buds rounded at the apex, 4–5 mm. long; fruits oblong-ellipsoid, 2 cm. long; leaves petiolate, more or less as above but larger; branchlets mostly terete; bracts small and early deciduous; fruits broadly ellipsoid, 2 cm. long 2. *petiolatum*

1. **P. anceps** *Oliv.*—F.T.A. 1 : 347, incl. vars.; Stapf 586; Chev. Bot. 124. A glabrous shrub or small tree with acutely angled branchlets, short scanty racemes of whitish flowers, and cherry-red drupes.
Sierra Leone: Bagroo River (fr. Apr.)! Kambui Reserve, in forest undergrowth (Mar.)! Liberia: Grand Bassa! Monrovia! Tappi! Yeh River (Oct.)! Peahtah! Banga! Ivory Coast: several localities! Exsicc.—*T. Vogel* 12. *Mann* 838. *Carder. Whyte. Lane-Poole* 205. *Bunting* 84. *Dinklage* 2037. *Linder* 980; 998; 1240.
2. **P. petiolatum** *Oliv.*—F.T.A. 1 : 347. A shrub 12–15 ft. high.
S. Nigeria: Oban! Also in French Cameroons and Spanish Guinea. Exsicc.—*Talb.* 1747.

6. STROMBOSIA Blume—F.T.A. 1 : 350; Engl. Bot. Jahrb. 43 : 165.

Leaves broadly elliptic, acuminate, rounded to broadly cuneate at the base, 12–20 cm. long, 6–9 cm. broad, glabrous, with about 5–7 pairs of lateral nerves and numerous transverse slightly arched tertiary nerves; petiole 1–2 cm. long; flowers very small in axillary clusters; pedicels very short; sepals very small, ovate-deltoid, free; petals 2·5 mm. long, pubescent within; fruits inferior, subglobose, hollow on the top, long-stipitate at the base, glabrous, about 1·4 cm. long (young)
1. *grandifolia*

Leaves elliptic or oblong-elliptic, as above, but 8–15 cm. long and 4·5–6 cm. broad, with 5 pairs of lateral nerves and indistinct reticulate tertiary nerves; flowers few, fasciculate, axillary, shortly pedicellate; sepals slightly ciliate; petals linear, 3–4 mm. long, shortly pubescent inside; fruits inferior, globose, 1 cm. diam., crowned by the persistent calyx-lobes .. .. 2. *pustulata*

1. **S. grandifolia** *Hook. f.*—F.T.A. 1 : 350. *S. retivenia* S. Moore. *S. Scheffleri* Engl. *Lavalleopsis densivenia* Engl. *L. grandifolia* Van Tiegh. A forest tree, sometimes reaching 90 ft. in height, with shining foliage and clusters of small yellowish-white flowers.
S. Nigeria: Benin (Jan.)! Eket! Oban! Victoria (Feb.)! Johann-Albrechtshöhe! Buea. Fernando Po (Nov., Jan.)! Common in French Cameroons and extending to the Congo. Exsicc.—*T. Vogel* 156. *Mann* 172. *Talb.* 3155. *Staudt* 548; 750. *Preuss* 1329. (See Appendix).
2. **S. pustulata** *Oliv.* in Hook. Icon. Pl. t. 2299; Chev. Bot. 125. A glabrous tree like the last, up to 60–70 ft. high; fruit purple-black when ripe.
Sierra Leone: Kambia (fr. Jan.)! Ivory Coast: Bingerville and locality! Bouroukrou (Dec., Jan.)! Agnieby Valley, Voguié (Jan.)! Anyama, Potou Lagoon! Morénou! S. Nigeria: near Lagos! Exsicc. —*Sc. Elliot* 4733. *Rowland. Chev.* 16103; 16178, etc. (See Appendix).

7. APTANDRA Miers in Ann. & Mag. Nat. Hist. Ser. 2, 7 : 201 (1851).

Branchlets terete, glabrous; leaves oblong-elliptic, acutely acuminate, shortly cuneate at the base, 6–10 cm. long, 3–5 cm. broad, glabrous and with very obscure nerves

below ; petiole up to 1 cm. long ; flowers in very short axillary racemes ; pedicels up to 8 mm. long, crowded ; calyx very small, undulate ; petals about 3 mm. long, becoming reflexed in the upper part ; fruits ellipsoid-ovoid, 2·5 cm. long, black, shining, surrounded by the spreading much-enlarged coloured entire calyx up to 8 cm. in diam. .. .. *Zenkeri*

A. Zenkeri *Engl.* in Engl. & Prantl, Pflanzenf. Nachtr. 1 : 147 ; Engl. Pflanzenw. Afr. 3, 1 : 80, fig. 44. A shrub or small tree up to 15 ft. high with green branchlets and small greenish-white flowers.
S. Nigeria ; Lagos ! Ajilite ! Lagos Colony (fr. Feb.) ! Also in French Cameroons, and extending to Angola. Exsicc.—*Millen* 25 ; 163. *Punch*.

8. ONGOKEA Pierre in Bull. Soc. Linn. Par. 2 : 1313 (1897).

Branchlets compressed or slightly winged ; leaves broadly oblong-elliptic, obtusely acuminate, 4–7 cm. long, 2·5–3·5 cm. broad, with obscure nerves, minutely papillose below ; flowers in paniculate clusters, small, numerous ; pedicels filiform, about 3 mm. long ; calyx saucer-shaped, undulate ; petals at first connivent, about 3 mm. long, with oblong claw and ovate limb ; fruit globose, about 2·5 cm. diam., closely invested by the persistent enlarged calyx, which ruptures into 3 segments *Klaineana*

O. Klaineana *Pierre* l.c. ; Chev. Bot. 122. A glabrous forest tree, up to 70–80 ft. high.
Ivory Coast : Bouroukrou (Dec., Jan.) ! Yapo (fr. Oct.) ! Also in French Cameroons and Gabon. Exsicc. —*Chev.* 16128 ; 22330. (See Appendix).

95. PENTADIPLANDRACEAE

Arborescent shrubs or climbers. Leaves exstipulate, alternate, simple, penni-nerved. Flowers dioecious, racemose ; racemes short, axillary ; bracts small, subulate. Sepals 5, free, lanceolate, imbricate ? Petals 5, scale-like, thicker and loosely connivent at the base, with lanceolate free limbs. Stamens 9–13, inserted on a short stout androgynophore ; filaments free, filiform ; anthers basifixed, 2-celled. Rudimentary ovary present, short, 3–5-celled, with 2 series of ovules in each cell. Staminodes about 10 from the top of the gynophore in the female flower. Ovary superior, at the top of the thick gynophore, 4–5-celled, with numerous axile 2–3-seriate ovules ; style 4–5-fid at the apex. Fruit a rounded berry ; seeds small, numerous, immersed in pulp.

PENTADIPLANDRA Baill. in Bull. Soc. Linn. Par. 1 : 611 (1886).

Characters of the family :

Arborescent shrub or climber ; branchlets closely sulcate, glabrous ; leaves oblong-obovate, obliquely cuspidate-acuminate, shortly cuneate at the base, 8–12 cm. long, 3–4 cm. broad, glabrous and closely reticulate on both surfaces, venation elevated on both sides ; lateral nerves 6–8 pairs, looped ; petiole 5–6 mm. long ; flowers about 1·5 cm. long, in short axillary and terminal racemes ; pedicels 0·5–1 cm. long ; sepals lanceolate, 5 mm. long, very minutely puberulous ; female flower with about 10 filiform staminodes ; ovary 4–5-celled, glabrous ; fruit ovoid-globose, about 3·5 cm. long .. .. *Brazzeana*

P. Brazzeana *Baill.* l.c. *Cercopetalum dasyanthum* Gilg in Engl. Bot. Jahrb. 24 : 308, t. 3 ; see also Gilg in Engl. Bot. Jahrb. 53 : 265. Erect or half scandent ; flowers conspicuous, petals white, spotted red or bluish towards the tips.
Recorded from the Dschang district of French Cameroons, which is just outside the eastern boundary of Nigeria, in which it may eventually be found ; extends through French Cameroons to the Belgian Congo. Exsicc.—*Ledermann* 1555.

96. OPILIACEAE

Trees, shrubs or woody climbers. Leaves alternate, simple ; stipules absent. Flowers mostly hermaphrodite. Calyx minute. Petals conspicuous in bud, 4–5, free or more or less united, valvate. Stamens as many as the petals and opposite to them, free or united to the base of the petals ; anthers 2-celled, opening lengthwise by slits. Disk-glands alternating with the stamens. Ovary superior or semi-inferior, 1-celled ; stigma sessile or style slender ; ovule solitary, pendulous or erect. Fruit drupaceous, often fleshy. Seeds with copious endosperm and rather small embryo.

A small family formerly included in the *Olacaceae* ; confined to the tropics ; rare in America ; mostly with very long slender racemes.

FIG. 162.—PENTADIPLANDRA BRAZZEANA *Baill.* (PENTADIPLANDRACEAE).

A, sepal. B, petal showing thickened basal portion and free limb. C, stamen. D, male flower. E, same in vertical section showing rudimentary ovary. F, corolla showing connivent basal portions of petals. G, cross-section of ovary. H, fruits.

Racemes much shorter than the leaves, clothed in bud with broad imbricate scales, the latter caducous; disk 5-partite .. .. 1. **Opilia**
Racemes much longer than the leaves, not clothed with scales when young; disk entire 2. **Urobotrya**

1. OPILIA Roxb.—F.T.A. 1 : 352.

Branchlets slightly flexuous, glabrous; leaves alternate, oblong to obovate-oblanceolate, acutely acuminate, cuneate at the base, 6–12 cm. long, 3–5 cm. broad, glabrous, with about 5 pairs of prominent lateral nerves; racemes at first covered with broad imbricate bracts and shortly catkin-like, at length slender and about 3–4 cm. long; pedicels fasciculate, 2 mm. long, puberulous; fruits ellipsoid, 2–2·5 cm. long, finely puberulous *celtidifolia*

O. celtidifolia *Endl.* in Walp. Rep. 1 : 377. *O. amentacea* Oliv.—F.T.A. 1 : 352, not of Roxb.; Chev. Bot. 126. *Grewia celtidifolia* Guill. & Perr. Tent. Fl. Senег. 1 : 101, t. 22. A woody climber, sometimes suberect with straight branches; twigs green; flowers small, yellowish-green, fragrant.
Widely spread, chiefly in the savannah regions, extending to East Africa. Exsicc.—*Heudelot* 341. *Barter* 720; 990. *Sc. Elliot* 4791; 4795. *Rowland* 13. *Elliott* 34. *Talb.* 568. *Kersting* 529. *Millbr.* 7507. (See Appendix).

2. UROBOTRYA Stapf in Journ. Linn. Soc. Bot. 37 : 89 (1904).

Leaves conspicuously trinerved from above the base to about or above the middle, nerves ascending:
Leaves oblong-elliptic, rather abruptly and acutely acuminate, slightly cuneate at the base, about 18 cm. long and 6–7 cm. broad, glabrous; racemes slender, about 18 cm. long; axis nearly glabrous; pedicels about 5 in a fascicle, filiform, 1 cm. long 1. *trinervia*
Leaves lanceolate-elliptic, shortly acuminate, cuneate at the base, 7–9 cm. long, 3–4 cm. broad, glabrous; racemes slender, about 15 cm. long; axis slightly pubescent; pedicels capillary, 5 mm. long, 2–4 in each fascicle .. .. 2. *Afzelii*
Leaves pinnately nerved:
Leaves broadly ovate-elliptic, more than ½ as broad as long, shortly and obtusely acuminate, rounded at the base, 10–14 cm. long, 7–8 cm. broad, glabrous; lateral nerves about 6 pairs, very prominent below; racemes rather stiff, 25 cm. long; axis densely puberulous; pedicels about 5 in a fascicle, 5–6 mm. long 3. *latifolia*
Leaves more or less narrowly ovate-elliptic to oblanceolate, much less than ½ as broad as long:
Leaves narrowly elongate-oblong, 10–15 cm. long, 2–3 cm. broad, gradually acuminate, acumen about 1 cm. long, closely reticulate below; racemes about 20–30 cm. long, very slender; axis glabrous; pedicels capillary, 7–8 mm. long 4. *angustifolia*
Leaves elliptic or ovate-elliptic, over 4 cm. broad:
Pedicels 10–12 mm. long; racemes 15 cm. long; axis stout; flowers 6–8 in a fascicle; leaves oblong-elliptic, about 14 cm. long and 5 cm. broad, more or less rounded at the base .. .. 5. *Stapfiana*
Pedicels 5–6 mm. long; racemes 20–30 cm. long; axis very slender; flowers 4–6 in a fascicle; leaves ovate-elliptic, gradually narrowed to the rather abruptly acuminate apex, about 15 cm. long and 6 cm. broad, rounded at the base; fruits ellipsoid, 2·5–3·5 cm. long, smooth .. .. 6. *minutiflora*

1. **Urobotrya trinervia** *Stapf* in Johnston, Liberia 2 : 587. *Opilia trinervia* Engl. A shrub, erect or more or less climbing, with green branchlets and long pendulous racemes of small greenish flowers with long-exserted stamens.
Liberia: Kakatown! Exsicc.—*Whyte.*
2. **U. Afzelii** *Stapf* in Journ. Linn. Soc. Bot. 37 : 90, in obs. *Opilia Afzelii* Engl. A shrub like the last; fruit ellipsoid on a thickened stalk.
Sierra Leone: Buri Town, sea-beach (Dec.)! Exsicc.—*Afzelius. Unwin & Smythe* 3.
3. **U. latifolia** *Stapf* l.c. 89; Stapf 587. *Opilia latifolia* Engl. Like the preceding; glabrous except on the inflorescence.
Liberia: Monrovia! Exsicc.—*Whyte.*
4. **U. angustifolia** *Stapf.* l.c. 89; Stapf 587. *Opilia angustifolia* Engl. A glabrous shrub, erect or ? scandent, resembling the preceding.
Sierra Leone: Freetown, Mt. Aureole (Feb.)! Liberia: Monrovia! Kakatown! St Paul's River, 70 miles from the sea! Exsicc.—*Whyte. Dalz.* 1006. *Lane-Poole* 154.
5. **U. Stapfiana** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. An erect shrub with lax flexuous green branchlets.
Sierra Leone: Bafi River, in forest undergrowth (Feb.)! Liberia: Kakatown! St. Paul's River, 70 miles from the sea! Exsicc.—*Whyte. Reynolds. Macdonald* 6. (See Appendix).
6. **U. minutiflora** *Stapf* l.c. 90. *Opilia minutiflora* Engl. A glabrous shrub, about 6 ft. high, with lax green branches, perhaps half scandent in forest undergrowth; fruit green olive-like.
S. Nigeria: Victoria (Jan.)! Between Buea and Mayuku (fl. and fr. Feb.)! Fernando Po! Exsicc.—*Dalz.* 8244. *Kalbreyer.*

96a. OCTOKNEMATACEAE

Trees and shrubs; leaves alternate, simple, with stellate hairs; stipules absent. Flowers unisexual in axillary racemes. Male flower: sepals 5, valvate. Petals absent. Stamens 5, opposite the sepals, free. Rudimentary ovary present.

Female flower : sepals 5, valvate ; no staminodes or disk. Ovary inferior, 1-celled ; style very short, 3–5-lobed, lobes bifid ; ovules 3, at the apex of a basal thread-like placenta which reaches and is adnate to the top of the ovary. Fruit drupaceous, with a single seed ; endosperm slightly ruminate, with small embryo, the radical much longer than the cotyledons.

OCTOKNEMA Pierre in Bull. Soc. Linn. 2 : 1290 (1897).

Characters of the family :

Branchlets stellate-puberulous ; leaves oblong-obovate, acuminate, shortly cuneate at the base, 15–25 cm. long, 5–8 cm. broad, stellate-puberulous on and towards the midrib below, with 6–7 pairs of lateral nerves ; petiole stellate-tomentellous, 2·5–3 cm. long, swollen towards the top ; racemes axillary or slightly supra-axillary, about 5–6 cm. long, covered all over with short stellate hairs ; pedicels 1–2 mm. long ; buds globose, very small ; fruit inferior, subglobose, about 1 cm. long, capped by the broad persistent calyx-lobes, wide open at the top .. .. .. 1. *borealis*

Branchlets at length glabrous ; leaves oblong, narrowly acuminate, obtuse at the base, 18–20 cm. long, 9–10 cm. broad, with about 6 pairs of arcuate ascending nerves ; flowers not known ; fruit sessile, ovoid, 3 cm. long, with a small opening at the top and crowned by 5 small teeth ; seed longitudinally grooved .. .. 2. *Winkleri*

1. **O. borealis** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *O. affinis* A. Chev. Bot. 125, not of Pierre.
French Guinea : Kouria ! Kissidougou (Feb.). Sierra Leone : road at North Kundita (Mar.) ! Ivory Coast : Attié Province, at Alépé (Mar.) ! Upper Cavally, near Oua (Apr.) ! Exsicc.—*Sc. Elliot* 5042. *Chev.* 18183 ; 20707 ; 16246 ; 21318 ; 21321.
2. **O. Winkleri** *Engl.* Bot. Jahrb. 43 : 177. A tree with dioecious flowers.
S. Nigeria : Victoria ; between N'Bamba and Kriegsshiffhafen (fr. Apr.). Exsicc.—*Winkler* 1238.

97. LORANTHACEAE

Parasitic shrubs on trees or rarely erect terrestrial trees or shrubs. Leaves mostly opposite or whorled, simple, entire, sometimes reduced to scales ; stipules absent. Flowers actinomorphic, hermaphrodite or unisexual, often brightly coloured. Calyx small or obsolete, adnate to the ovary. Petals valvate, free or united high up into a tube which is often split down one side. Stamens the same number as the petals and inserted on them or at their base ; anthers 2-celled or rarely 1-celled, sometimes divided into numerous smaller cells, opening lengthwise or by terminal pores or transverse slits. Disk present or absent. Rudimentary ovary often present in the male, staminodes in the female. Ovary inferior, usually without a distinct placenta and ovule ; style simple or absent, stigma more or less capitate. Fruit a berry or drupe. Seed solitary, without a distinct testa ; endosperm present or absent ; embryo large.

Numerous in the tropics of both hemispheres, and easily detected by the usually parasitic habit, inferior ovary with diminutive calyx, usually brightly coloured corolla, with as many stamens as petals or corolla-lobes, and inserted on and opposite to them.

Calyx present, lobed or truncate ; petals free or united, usually brightly coloured ; flowers hermaphrodite ; leaves alternate, opposite or whorled, well developed 1. **Loranthus**

Calyx obsolete ; petals free ; flowers unisexual, monoecious or dioecious ; leaves opposite, well developed or scale-like .. .. 2. **Viscum**

1. LORANTHUS Linn.—F.T.A. 6, 1 : 255. (See Appendix).

Petals free from each other, about 8 mm. long ; leaves oblong-lanceolate to oblong-elliptic, rounded at the apex, narrowly cuneate at the base, 4–8 cm. long, 1–3 cm. broad, glabrous ; petiole nearly 1 cm. long ; flowers in short axillary racemes ; pedicels 1·5 mm. long .. .. 1. *sublilacinus*

Petals united high up :

Anthers tranversely septate :

Corolla-lobes reflexed :

Leaves more or less acuminate, oblong-lanceolate, rounded at the base, 6–10 cm. long, 3–4 cm. broad, densely stellate-tomentellous below ; flowers numerous in dense clusters, rusty tomentose-pilose, 3–3·5 cm. long .. .. 2. *leonensis*

Leaves rounded at the apex, oblong-ovate, rounded at the base, 5–8 cm. long, 2–3·5 cm. broad, stellate-tomentose below ; flowers several in dense clusters, rusty-villous, about 3·5 cm. long ; corolla-lobes 8 mm. long .. 3. *nigritanus*

Corolla-lobes erect :
Corolla 7–9 cm. long, scurfy-tomentellous outside ; lobes 2 cm. long ; leaves oblong-obovate, rounded at the apex, shortly cuneate at the base, closely lepidote, especially when young ; petiole 2 cm. long ; calyx 5 mm. long, densely lepidote ; fruit 2 cm. long .. .. 4. *kamerunensis*
Corolla up to 5 cm. long :
Leaves rounded at the base or if slightly cordate then long-petiolate :
Leaves narrowly oblong-lanceolate, obtuse or subacute, 4·5–5·5 cm. long, 1·5 cm. broad, shining and glabrous above, densely rusty-tomentose beneath ; petiole 1·5 cm. long, stout ; corolla slender, 3·5 cm. long ; tube tomentellous ; lobes glabrous, 3 mm. long .. .. 5. *nitidulus*
Leaves elliptic, obtuse at each end, rusty-pubescent when young, leathery ; corolla in bud 6 mm. long, pentagonal at the apex ; fruit ovoid 6. *rufescens*
Leaves broadly ovate, obtusely pointed, rounded at the base, 6–12 cm. long, up to 8 cm. broad, grey-stellate-tomentellous below ; petiole about 2 cm. long ; flowers densely cymose, 4–5 cm. long ; corolla glabrous or slightly lepidote ; lobes linear, 1 cm. long .. .. 7. *incanus*
Leaves deeply cordate at the base, subsessile, ovate-oblong, about 18 cm. long and 8 cm. broad, thick and rigid, glabrous, with the lateral nerves spreading at right angles ; flowers in a sessile cluster, 4·5 cm. long ; corolla tomentose with branched hairs .. .. 8. *Talbotiorum*
Anthers not transversely septate :
Corolla-lobes revolute :
Lateral nerves 2–3 on each side of the midrib and more or less parallel with it 9. *Dinklagei*
Lateral nerves not parallel with the midrib :
Umbels with numerous (about 20) flowers :
Leaves oblong-ovate, broadly pointed, rounded at the base, 6–9 cm. long, 3–4 cm. broad, thick and rigid, glabrous ; petiole 1–1·5 cm. long ; peduncles about 2 cm. long ; pedicels 4–5 mm. long, glabrous ; corolla about 3 cm. long, glabrous ; bracts and calyx ciliolate .. .. 10. *oreophilus*
Leaves ovate or oblong, subacute at the apex, more or less cordate at the base, rusty-pubescent when young ; peduncles very short, rusty-pubescent ; corolla pubescent, pentagonal at the apex .. .. 11. *cupulatus*
Umbels up to 8-flowered, very shortly pedunculate ; pedicels 1·5 mm. long ; corolla 2–3 cm. long, glabrous, with a globose basal swelling ; leaves broadly ovate-elliptic to orbicular, 7–12 cm. long and broad, rigid, glabrous, with much-branched lateral nerves .. .. 12. *Braunii*
Corolla-lobes not revolute :
Corolla-lobes 5 :
Corolla-lobes soon reflexed :
Corolla glabrous outside :
Corolla-buds 5-horned at the top ; tube 3 cm. long ; lobes 5 mm. long, thick ; leaves ovate, obtuse at the apex, rounded or subcuneate at the base, 5–9 cm. long, 3–4 cm. broad, glabrous ; petiole 8 mm. long .. .. 13. *Farmari*
Corolla-buds not horned at the top :
Apical swelling of corolla-bud conspicuously winged :
Corolla about 7 cm. long on opening ; lobes 5 mm. long, thick, concave inside ; leaves ovate-orbicular, abruptly acuminate, 8–15 cm. long, thick, papillose below .. .. 14. *Preussii*
Corolla up to 4 cm. long on opening :
Calyx 3·5 mm. long ; leaves shortly ovate, about 5 cm. long and 3 cm. broad, thick, glabrous ; floral clusters sessile ; branchlets pale 15. *Pentagonia*
Calyx 5 mm. long ; leaves ovate-lanceolate, about 7 cm. long and 3·5 cm. broad, rigid ; branchlets brown-purple .. .. 16. *senegalensis*
Apical swelling of corolla-bud not conspicuously winged, at most ridged :
Leaves elongate linear-lanceolate, subacute, slightly arcuate, 6–12 cm. long, 1–1·8 cm. broad, thick, cuneate at the base ; flowers in a dense cluster ; corolla 2·5 cm. long, the apical part oblong-ellipsoid, about 3 mm. long 17. *globiferus* var. *salicifolius*
Leaves elliptic to ovate or if narrow then shortly so :
Leaves 5 cm. or more broad, more or less broadly elliptic to ovate :
Leaves more or less acuminate, 6–18 cm. long, 2·5–12 cm. broad ; apical swelling of corolla-bud ellipsoid .. .. .. 18. *bangwensis*
Leaves not acuminate, 5–12 cm. long, 1·5–7 cm. broad ; apical swelling ovoid or oblong .. .. 19. *lanceolatus*
Leaves up to about 3 cm. broad, oblong-lanceolate or narrowly elliptic :
Leaves acuminate, lanceolate ; apical swelling on corolla-bud narrowly ovoid .. .. 20. *ophioides*

Leaves not acuminate, oblong or oblong-elliptic; apical swelling shortly ellipsoid .. .. 17. *globiferus* var. *verrucosus*

Corolla puberulous or pubescent outside:

Leaves sessile, cordate at the base, rounded at the apex, 4–7 cm. long, 2·5—5 cm. broad, strongly nervose below; corolla 3 cm. long, the apical bud truncate 21. *Warneckei*

Leaves petiolate, rounded at the base, ovate, almost emarginate, about 5 cm. long and 3 cm. broad, glabrous; flowers more or less as in preceding 22. *truncatus*

Leaves long-petiolate, rounded at the base, rounded or obtuse at the apex, 6–9 cm. long, 3–5 cm. broad, glabrous; corolla 3·5 cm. long, the apical bud oblong-ellipsoid .. .. 23. *pubiflorus*

Corolla-lobes remaining erect:

Corolla glabrous:

Leaves linear-lanceolate or almost linear, thick, obscurely nerved, up to 14 cm. long and 2·3 cm. broad, glabrous; flowers about 3 together, sessile, 4·5 cm. long; fruits obovoid, about 1·3 cm. long .. .. .. 24. *dodoneaefolius*

Leaves ovate or oblong-lanceolate, nervose, about 10 cm. long and 3 cm. broad, glabrous; flowers numerous, pedicellate, 3·5 cm. long, very slender 25. *micranthérus*

Leaves broadly ovate or ovate-orbicular, nervose, about 14 cm. long and 9 cm. broad; flowers few, subsessile, 5–7 cm. long, slender at the base 26. *Buntingii*

Corolla villous, 3–4 cm. long; flowers several in a short cyme; leaves ovate or ovate-lanceolate, rounded at the apex, 4–7 cm. long and up to 4 cm. broad, pubescent mainly on the midrib .. .. 27. *tambermensis*

Corolla-lobes 4:

Peduncles and pedicels rather slender, the latter about 7 mm. long; corolla slender, glabrous, 2 cm. long; leaves lanceolate, obtusely pointed, 8–10 cm. long, 2·5–3 cm. broad, glabrous .. .. 28. *parviflorus*

Peduncles and pedicels stout, the latter about 2–3 mm. long; corolla angular, 2 cm. long, glabrous; leaves ovate or ovate-lanceolate, obtuse, nervose, up to 10 cm. long and 4 cm. broad, glabrous .. .. 29. *Lecardii*

1. **Loranthus sublilacinus** *Sprague*—F.T.A. 6, 1 : 275. Young branchlets purplish, lenticellate, glabrous.
S. Nigeria: Johann-Albrechtshöhe! Also in French Cameroons. Exsicc.—*Staudt* 757.

2. **L. leonensis** *Sprague*—F.T.A. 6, 1 : 282. Young branchlets and flowers rusty brown-tomentose with branched hairs.
Sierra Leone: various localities! Exsicc.—*Mann*. *Barter*. *Sc. Elliot* 4578; 4997; 5294; 5472.

3. **L. nigritanus** *Hook. f.*—F.T.A. 6, 1 : 282. Like the preceding.
N. Nigeria: Mt. Patti! S. Nigeria: Abeokuta (Jan.)! Oban! Also in French Cameroons. Exsicc.—*Barter* 3383. *T. Vogel* 170. *Rowland*.

4. **L. kamerunensis** *Engl.*—F.T.A. 6, 1 : 282. Branchlets stout, brownish-scaly; flowers large, orange-red.
N. Nigeria: Kontagora Prov.; Kurijin Maidawa (June)! S. Nigeria: Oban! Also in French Cameroons. Exsicc.—*Dalz*. 551. *Talb*. 606.

5. **L. nitidulus** *Sprague*—F.T.A. 6, 1 : 283. Branchlets and flowers densely rusty-pubescent with branched hairs.
Fernando Po: 7,000 ft.! Exsicc.—*Mann* 2346.

6. **L. rufescens** *DC.*—F.T.A. 6, 1 : 291.
Senegal: near Nghianga. Exsicc.—*Leprieur & Perrottet*.

7. **L. incanus** *Schum. & Thonn.*—F.T.A. 6, 1 : 292; 1028; Chev. Bot. 548. Youngest parts light brownish-pubescent, soon glabrous; flowers narrow, red or orange tipped with red.
Common from Ivory Coast to N. and S. Nigeria! Cameroons Mt.: Buea! Fernando Po! extending to Angola. Exsicc.—*T. Vogel* 47. *Barter* 1147; 3288; 3324. *Mann* 275. *Talb*. 607. *Preuss* 772. *Warnecke* 332.

8. **L. Talbotiorum** *Sprague*—F.T.A. 6, 1 : 1026. Branchlets stout, terete, flattened upwards, red-brown-tomentose near the insertion of the leaves.
S. Nigeria: Oban! Eket! Exsicc.—*Talb*. 1281.

9. **L. Dinklagei** *Engl.*—F.T.A. 6, 1 : 301. Branchlets slender, striate, subangular, glabrous; flowers slender.
S. Nigeria: Victoria! Also in French Cameroons. Exsicc.—*Hanke* 622.

10. **L. oreophilus** *Oliv.*—F.T.A. 6, 1 : 301; 1028. Branchlets brown-purple, slightly angled, glabrous; flowers red, slender.
Cameroons Mt.: 6,000–8,030 ft.! Also in French Cameroons. Exsicc.—*Mann* 1210; 2163. *Preuss* 811.

11. **L. cupulatus** *DC.*—F.T.A. 6, 1 : 305. Branchlets rusty-hairy.
Senegal: Casamance. Exsicc.—*Leprieur & Perrottet*.

12. **L. Braunii** *Engl.*—F.T.A. 6, 1 : 303; 1028; Chev. Bot. 547. Branchlets dark brown, glabrous, striate; leaves shining when young; flowers pink or bright scarlet.
Togo: Lome! Bagida. Dahomey: Sakété (Jan.). S. Nigeria: Lagos, Ikoyi (Nov.)! Ilaro (Oct.)! Igbajun! Ila (Oct.)! Eket! Oban! Calabar River (Feb.)! Extends to Angola and Uganda. Exsicc.—*Mann* 2294. *Moloney* 24. *Punch* 40. *Dalz*. 1231. *Warnecke* 109.

13. **L. Farmari** *Sprague*—F.T.A. 6, 1 : 345. Branchlets slender, glabrous; flowers scarlet.
Gold Coast! Exsicc.—*Farmar* 503.

14. **L. Preussii** *Engl.*—F.T.A. 6, 1 : 348. Branchlets purplish-brown, glabrous; flowers large, red inside or red-striped.
S. Nigeria: north of Barombi! Also in French Cameroons. Exsicc.—*Preuss* 419.

15. **L. Pentagonia** *DC.*—F.T.A. 6, 1 : 349; Chev. Bot. 549. Branchlets terete, greyish-brown; flowers 5-winged near the top before opening, a little over 1 in. long.
Senegal: on species of *Acacia*! Also in Mauritania. Exsicc.—*Perrottet & Leprieur*.

16. **L. senegalensis** *De Wild.*—F.T.A. 6, 1 : 349. Branchlets glabrous; flowers 1½ in. long in bud.
Senegal! Exsicc.—*Lecard* 83; 84.

17. **L. globiferus var. salicifolius** *Sprague*—F.T.A. 6, 1 : 352.
N. Nigeria ! Also in Abyssinia. Exsicc.—*Yates* 59.
var. **verrucosus** *Sprague*—F.T.A. 6, 1 : 353. *L. globiferus* var. *bornuensis* Sprague.
N. Nigeria : various localities ! Also in N.E. Trop. Africa. Exsicc.—*Barter* 1126 ; 1149. *Vogel* 79 *Elliott* 115. *Dalz.* 204. *Lamb* 9. *Dent-Young* 224.
18. **L. bangwensis** *Engl. & Krause*—F.T.A. 6, 1 : 353.
Senegal to S. Nigeria. Also in French Cameroons. Exsicc.—*Mann* 803. *Sc. Elliot* 3916 ; 5783. *Chipp* 243. *Vogel* 40.
19. **L. lanceolatus** *P. Beauv.*—F.T.A. 6, 1 : 354.
Togo to S. Nigeria. Also in French Cameroons. Exsicc.—*Kersting* 108 ; 175 ; A. 506 ; A. 624. *Barter* 229. *Irving* 67. *Dalz.* 216.
20. **L. ophioides** *Sprague*—F.T.A. 6, 1 : 1031.
French Guinea : Kouroussa ! French Sudan : Gourma ! Exsicc.—*Chev.* 24438 ; 24532. (See Appendix).
21. **L. Warneckei** *Engl.*—F.T.A. 6, 1 : 356. Branchlets slender, greyish-brown and slightly pubescent when young ; flowers red with 5 dark longitudinal lines.
Togo : Lome ! Exsicc.—*Warnecke* 36.
22. **L. truncatus** *Engl.*—F.T.A. 6, 1 : 356. Young branchlets densely and minutely pilose.
Sierra Leone ; Gold Coast : ? locality ! Exsicc.—*Afzelius. Krause* 95.
23. **L. pubiflorus** *Sprague*—F.T.A. 6, 1 : 1033 ; Chev. Bot. 549.
Ivory Coast : Ringerville (Dec.) ! Exsicc.—*Chev.* 16047 ; 16059.
24. **L. dodoneaefolius** *DC.*—F.T.A. 6, 1 : 341 ; Chev. Bot. 548. *L. Chevalieri* Engl. & Krause. Branchlets pale grey-brown, glabrous, with narrow leaves and bright red flowers split down one side.
From Mauritania and Senegal to Ubangi-Shari and Upper Nile Land ! Exsicc.—*Roger. Barter* 1559. *Dalz.* 203 ; 764 ; 797. *Lely* 498.
25. **L. micrantherus** *Engl.*—F.T.A. 6, 1 : 383. Branchlets glabrous, striate, red-brown when dry ; flowers yellow and red.
Sierra Leone : Bagroo River (Apr.) ! Batkanu (Apr) ! Also in Spanish Guinea and Lower Congo. Exsicc.—*Mann* 889. *Thomas* 26.
26. **L. Buntingii** *Sprague* in Kew Bull. 1916 : 178. Flowers red in the upper part, split down one side, narrowly winged at the top in bud.
Liberia : Mt. Barclay ! Exsicc.—*Bunting* 165.
27. **L. tambermensis** *Engl. & Krause*—F.T.A. 6, 1 : 380. Branchlets yellowish-pubescent when young ; flowers yellow, split down one side, rusty-woolly.
Togo : Tamberma, on hills ! N. Nigeria : Sokoto, in the south of the province (May) ! Yola (June) ! Exsicc.—*Kersting* A. 502. *Dalz.* 214 ; 524.
28. **L. parviflorus** *Engl.*—F.T.A. 6, 1 : 383 ; Chev. Bot. 549. Branchlets slender, striate, glabrous ; flowers comparatively small and narrow, red.
French Guinea : Labé (Apr.) ! Dalaba. Sierra Leone : Bagroo River (Apr.) ! Exsicc.—*Mann* 823.
29. **L. Lecardii** *Engl.*—F.T.A. 6, 1 : 384 ; Chev. Bot. 548. Branchlets slender, glabrous ; flowers orange-yellow, 4-angled in bud, ribbed along the midribs of the corolla-lobes.
Senegal ! French Guinea : Kouroussa ! Exsicc.—*Lecard* 180 ; 193. *Pobéguin* 425.

Imperfectly known species.

L. sessilifolius *P. Beauv.* Fl. Owar. 2 : 8, t. 63—F.T.A. 6, 1 : 355.
Region ? : Koto (Kéta). Exsicc.—*Beawois.*
L. Thonningii *Schum. & Thonn.* Beskr. Guin. Pl. 179—F.T.A. 6, 1 : 363.
Gold Coast. Exsicc.—*Thonning.*

2. VISCUM Linn.—F.T.A. 6, 1 : 393.

Branches 2-angled, compressed ; leaves obovate to oblanceolate, rounded at the apex, narrowly cuneate at the base, 2–5 cm. long, 1–2 cm. broad, glabrous, with 3–5 parallel nerves ; cymules axillary and terminal, solitary or ternate, 3-flowered ; flowers monoecious, tetramerous ; young fruit oblong-ellipsoid .. .. .. 1. *decurrens*
Branchlets not compressed :
Berry obovoid ; leaves rather shortly and abruptly pointed, about twice as long as broad .. .. 2. *grandifolium*
Berry ovoid ; leaves gradually and rather long pointed, 2½ times as long as broad or more .. .. 3. *Zenkeri*

1. **V. decurrens** *Bak. & Sprague*—F.T.A. 6, 1 : 398.
S. Nigeria : Eppah ! Calabar River ! Oban ! Lagos ! Victoria ! Extends to Lower Congo. Exsicc.—*Talb.* 669. *Winkler* 550. *Barter* 3314. *Dalz.* 1038. *Mann* 2278. (See Appendix).
2. **V. grandifolium** *Engl.*—F.T.A. 6, 1 : 400.
S. Nigeria : Victoria ! Also in French Cameroons. Exsicc.—*Winkler* 23a.
3. **V. Zenkeri** *Engl.*—F.T.A. 6, 1 : 401 ; Chev. Bot. 549.
Ivory Coast : Aboisso (Apr.) ! Also in French Cameroons. Exsicc.—*Chev.* 17847.

98. SANTALACEAE

Trees, shrubs or herbs, sometimes parasitic on trees or roots. Leaves alternate or opposite, entire, sometimes reduced to scales, exstipulate. Flowers often greenish, hermaphrodite or unisexual, actinomorphic. Calyx often fleshy, adnate to the ovary, lobes 3–6, valvate or slightly imbricate. Petals absent. Stamens the same number as the calyx-lobes and opposite to them ; anthers 2-celled, opening lengthwise. Disk epigynous. Ovary inferior or half inferior, 1-celled ; style simple. Ovules 1–3, pendulous from the top of a basal placenta. Fruit nut-like or drupaceous. Seed without a testa ; endosperm copious ; embryo straight ; cotyledons mostly terete.

A small family, very sparingly represented in the area of this flora. Marks of identification are the inferior ovary, basal placenta, often parasitic habit, absence of testa to the seed, etc.

THESIUM Linn.—F.T.A. 6, 1 : 411.

Parasitic herbs or undershrubs with much-reduced leaves ; flowers hermaphrodite ; calyx-tube adnate to the ovary ; lobes usually 5, valvate, with a tuft of hairs within ; stamens 5 ; anthers 2-celled ; ovary inferior ; ovules 2–4, pendulous ; fruit dry, globose, crowned by the persistent calyx.

Stems glabrous :
Stems straight and subsimple ; flowers spicate ; calyx about 5 mm. long 1. *leucanthum*
Stems branched in the lower part ; flowers axillary, scattered ; calyx about 2 mm. long .. .. 2. *tenuissimum*

Stems more or less pubescent, branched from the base ; flowers axillary, scattered ; calyx about 2 mm. long .. .. 3. *viride*

FIG. 163.—THESIUM VIRIDE *A. W. Hill* (SANTALACEAE).

A, flowering branch. B, flower with bract and bractcoles. C, same in vertical section with calyx spread out. D, young fruits showing calyx adnate to the ovary. E, mature fruit. F, portion of calyx in fruiting stage.

1. **Thesium leucanthum** *Gilg*—F.T.A. 6, 1 : 420. Stems 18 in. high, strict ; flowers yellow.
N. Nigeria : Naraguta ! Also in S. Angola. Exsicc.—*Lely* 66.
2. **T. tenuissimum** *Hook. f.*—F.T.A. 6, 1 : 421. A small undershrub ; stems numerous, slender, glabrous, grooved, branched, 4–10 in. long, from a woody rootstock.
Cameroons Mt., 8,000–9,000 ft. (Nov.–Feb.) ! Fernando Po, 9,000 ft. (Dec.) ! Exsicc.—*Mann* 595 ; 1223 ; 1961. *Johnston* 24. *Dalz.* 8327.
3. **T. viride** *A. W. Hill*—F.T.A. 6, 1 : 426. A low perennial undershrub, with greyish-green grooved branches, glabrous or scabrid, up to 15 in. high, from a woody rootstock.
N. Nigeria : Sokoto to Bauchi Plateau, common in dry grassy bush ! Also in N. Cameroons. Exsicc.—*Dalz.* 416 ; 549. *Hill* 49 ; 52. *Hepburn* 17. *Lely* 5.

99. BALANOPHORACEAE

Fleshy herbs parasitic on roots, annual or perennial, destitute of chlorophyll and stomata. Flowers ♂ ♀, very rarely ☿, densely crowded into unisexual or androgynous inflorescences ; ♂ flowers without or with a valvate 3–8-lobed perianth. Stamens 1–2 in the achlamydeous flowers, in those with a perianth often equal in number to and opposite the lobes ; filaments free or connate ; anthers 2–4-celled or with many cells, free or connate, opening by pores or slits.

Ovary 1–3-celled, adnate to the perianth when present; styles 1–2, terminal or rarely the stigma sessile and discoid; ovule solitary in each cell, mostly pendulous, nude or with a single integument. Fruit small, nut-like, 1-celled, 1-seeded. Seeds with abundant endosperm and very small embryo.

Stems and flower-heads covered with rigid imbricate scales; flowers unisexual, arranged in capitula .. .. 1. **Thonningia**

Stems nude; flowers polygamous, in a cylindric spadix with inconspicuous bracts 2. **Cynomorium**

Fig. 164.—Thonningia sanguinea *Vahl* (Balanophoraceae).
A, plant with several flower heads. B, male flowers.

1. THONNINGIA Vahl—F.T.A. 6, 1 : 436.

Flower-heads subglobose, unisexual:

Flower-heads 2–3 cm. diam.; scales of the peduncle ovate-lanceolate, gradually increasing in size upwards, up to 1·5 cm. long, keeled, serrulate, glabrous outside, pubescent inside the base; peduncle up to 7 cm. long .. .. .. 1. *sanguinea*

Flower-heads 2·5–4 cm. diam.; scales of the peduncle ovate-triangular, 4–8 mm. long, subacute; peduncle up to 1·5 cm. long .. .. 2. *dubia*

Flower-heads ovoid, unisexual; scales of the peduncle ovate, of the involucre narrowly lanceolate, acuminate, acute, up to 3 cm. long; peduncle very short .. 3. *elegans*

1. **Thonningia sanguinea** *Vahl*—F.T.A. 6, 1 : 438 ; Holl. 4 : 571 ; Chev. Bot. 550. A herb, parasitic on roots of trees and shrubs, tuberous at the point of attachment ; flower-heads crimson turning brown, arising from a pubescent branched rhizome, on peduncles ¼–3 in. long.
In forests, especially wooded hills, from Sierra Leone to Cameroons, extending to Lower Congo. Exsicc. —*Thonning*. *Barter* (no number). *Mann* 907. *Millson* 145. *Millen* 172. *Cummins* 192. *Elliott* 187. *Dalz.* 759. (See Appendix).
2. **T. dubia** *Hemsl.*—F.T.A. 6, 1 : 438. Like the last, with rather larger flower-heads, having longer scales and very short peduncles.
Cameroons Mt. forest, 5,000 ft. ! Exsicc.—*Kalbreyer* 105.
3. **T. elegans** *Hemsl.*—F.T.A. 6, 1 : 439.
Gold Coast : Aburi (Jan.) ! Exsicc.—*Johnson* 521.

2. CYNOMORIUM Linn.—Benth. & Hook. f. Gen. Pl. 3 : 234.

A leafless fleshy parasitic herb with a nude fleshy peduncle and cylindric spadix of numerous small flowers ; calyx-lobes usually 4–6, linear-clavate ; stamen 1 ; ovary stipitate, ovoid-globose, 1-celled ; fruit a nut, tipped by the persistent style

coccineum

C. coccineum *Linn.* Sp. Pl. 970 ; Chev. Bot. 550.
Mauritania : Himiri, Tiris, Aftana, Adrar Soultouf. Chiefly in the Mediterranean region and N. Africa.

100. RHAMNACEAE

Trees or shrubs, sometimes climbing. Leaves simple, alternate or opposite ; stipules mostly present. Flowers often cymose or fasciculate, small, hermaphrodite or polygamous. Calyx-lobes valvate. Petals 4 or 5, small, or absent. Stamens 4–5, opposite the petals ; anthers 2-celled, opening lengthwise. Disk mostly present, perigynous. Ovary sessile, superior or subinferior, 2–4-celled ; ovules solitary or rarely paired, erect from the base, anatropous. Fruit various, often drupaceous. Seeds mostly with copious endosperm and large straight embryo.

Mainly tropics and temperate regions ; comparatively rare in Africa ; recognised at once by the stamens being opposite the free often spathulate petals and presence of a disk.

Leaves alternate, or if subopposite then stipules extrapetiolar :
Ovary and fruit superior or subsuperior :
Leaves 3–5-nerved from the base ; fruits drupaceous, not winged ; stipules spiny
1. **Zizyphus**
Leaves pinnately nerved ; stipules not spiny :
Flowers cymose ; fruits not winged .. .. 2. **Maesopsis**
Flowers fasciculate ; fruits with a long terminal wing .. .. .. 3. **Ventilago**
Ovary and fruit inferior, the latter with 3 lateral wings ; branches with tendrils
4. **Gouania**
Leaves opposite ; stipules interpetiolar ; no tendrils ; flowers in lax cymes ; ovary subinferior .. .. 5. **Lasiodiscus**

1. ZIZYPHUS Juss.—F.T.A. 1 : 379.

Leaves glabrous below or pubescent only on the nerves :
Branchlets glabrous, pale or nearly white ; leaves ovate-lanceolate or broadly elliptic, subacute, at most rounded at the base, 3–8 cm. long, 1–4 cm. broad, callus-crenulate, 3-nerved from the base, nerves reaching to the apex ; cymes shortly pedunculate ; sepals thinly tomentose ; fruits fleshy, subglobose, about 2 cm. diam. when ripe ; spines small and recurved .. .. 1. *Spina-Christi*
Branchlets pubescent, brown or dark brown ; leaves mostly broadly ovate, subcordate at the base, broadly acuminate, 4–9 cm. long, 2–6 cm. broad, thin, crenulate, 3-nerved from the base ; cymes subsessile and very small ; sepals glabrous outside or very nearly so ; fruits globose, about 1·3 cm. diam.
2. *mucronata*
Leaves softly tomentose all over the lower surface ; branchlets softly pubescent ; leaf-blade elliptic to elliptic-suborbicular, mostly rounded at the apex, unequal-sided but scarcely cordate at the base, 3–7 cm. long, 2–4 cm. broad, crenulate, 3-nerved from the base, the side-nerves with several lateral branches ; cymes subsessile, sometimes dense ; sepals tomentose outside ; fruits globose, about 2 cm. diam. ; spines curved or straight .. .. 3. *jujuba*

Z. Spina-Christi *Willd.*—F.T.A. 1 : 380 ; Holl. 1 : 163 ; Chev. Bot. 137. A shrub or tree up to about 30 ft. high, with pale foliage and bark and small greenish-yellow flowers.
Throughout the dry regions from Mauritania eastwards to Arabia. Exsicc.—*E. Vogel* 31. *Barter* 736 ; 738 ; 1707 ; 3428. *Elliott* 138. (See Appendix).
2. **Z. mucronata** *Willd.*—F.T.A. 1 : 380 ; Holl. 1 : 162 ; Chev. Bot. 136. *Z. Baclei* DC.—Guill. & Perrott. Tent. Fl. Seneg. 1 : 145, t. 37. A straggling shrub armed with strong recurved spines.
Common all over the drier parts of tropical Africa and in S. Africa. Exsicc.—*Roger*. *T. Vogel* 100 *Barter* 1173. *Elliott* 132. (See Appendix).

3. Z. jujuba *Lam.*—F.T.A. 1 : 379 ; Holl. 1 : 161 ; Chev. Bot. 136. *Z. abyssinicus* Hochst. *Z. orthacantha* DC. A shrub or tree up to 30–40 ft. high, sometimes scrambling, variable in foliage ; leaves usually ochrey-tomentose below ; fruits smooth, red-brown when ripe.

Widely spread in tropical Africa and other tropical regions. Exsicc.—*Heudelot* 433. *Roger. Boteler. E. Vogel* 23. *Barter* 1330. *Elliott* 137. *Imp. Inst.* 51907. *Krause. Poéguin* 426. *Chev.* 24367. (See Appendix).

2. MAESOPSIS Engl. Pflanzenw. Ost-Afr. C. 255 (1895).

Leaves alternate or subopposite, broadly oblong-lanceolate, gradually acuminate, rounded at the base, 8–15 cm. long, 3–5 cm. broad, entire or remotely toothed, slightly puberulous on the nerves below, with about 8–10 pairs of lateral nerves and numerous fine parallel tertiary nerves ; petiole 0·5–1 cm. long ; stipules subulate, 7 mm. long ; cymes axillary, rusty-pubescent, about ¼ as long as the leaves ; sepals puberulous ; fruit oblong, acute, turgid, 3 cm. long, glabrous .. .. *Eminii*

M. Eminii *Engl.* Pflanzenw. Ost-Afr. C. 255. *M. berchemoides* A. Chev. *Karlea berchemoides* Pierre. A tree up to 50 ft. high with small greenish flowers and fruits purple-black.

Togo : Misahöhe ! S. Nigeria : Johann-Albrechtshöhe ! Fernando Po : Bokoko ! Extends to the Portuguese Congo and Uganda. Exsicc.—*Staudt* 533. *Mildbraed* 6876 ; 7225.

3. VENTILAGO Gaertn.—F.T.A. 1 : 378.

Branchlets minutely pubescent towards the top ; leaves oblong-elliptic, obtusely and broadly acuminate, rounded and slightly unequal-sided at the base, 5–9 cm. long,

FIG. 165.—GOUANIA LONGIPETALA *Hemsl.* (RHAMNACEAE).

A, inflorescence. B, flower-bud. C, open flower. D, same in vertical section. E, cross section of ovary. F, fruits. G, single fruit. H, same in cross section. I, winged seed.

2·5–3·5 cm. broad, serrulate, with 5–7 pairs of lateral nerves and numerous spreading parallel tertiary nerves, glabrous ; petiole 5 mm. long, thinly pubescent ; flowers few in axillary fascicles ; fruits broadly ovoid, produced above into an elongate-oblong-lanceolate mucronate wing 4·5 cm. long and 1 cm. broad, girt at the base by the rim-like calyx .. .. *africana*

V. africana *Exell* in Journ. Bot. 1927 : Suppl. Polypet. 80. *V. leiocarpa* Hemsl.—F.T.A. 1 : 378, partly, not of Benth. ; Chev. Bot. 136. *V. madraspatana* Engl. Pflanzenw. Afr. 3, 2 : 310, not of Gaertn. A climbing shrub or a small tree, with small pubescent greenish flowers.

French Guinea : Kouria ! Sierra Leone : Mamaha (Nov.) ! Ivory Coast : Bouroukrou (Dec.-Jan.) ! Attié, by the stream Mé. S. Nigeria : Epe ! Extends to Angola and Uganda. Exsicc.—*Barter* 3287. *Thomas* 4586 ; 4644. *Chev.* 14898 ; 16532 ; 17386.

4. GOUANIA Linn.—F.T.A. 1 : 383.

Climbing shrub ; tendrils terminal, simple, circinate ; leaves ovate, broadly acuminate, subcordate at the base, 5–7 cm. long, up to 5 cm. broad, obtusely crenulate, with about 4 pairs of conspicuous arcuate ascending lateral nerves, finely reticulate below ; petiole 1–1·5 cm. long ; racemes terminal or axillary, slender, sometimes bearing tendrils ; flowers small, in separate clusters on the raceme ; fruits inferior, 3-winged, broadly orbicular, cordate at each end, nearly 1 cm. diam., glabrous, wings very loosely reticulate .. .. *longipetala*

Gouania longipetala *Hemsl.*—F.T.A. 1 : 383, partly ; Stapf 590 ; Chev. Bot. 138. *G. Klainei* Pierre. Flowers white, fragrant.
French Guinea to S. Nigeria, and extending south to Angola ! Exsicc.—*Mann* 17. *Sc. Elliot* 4741. *Whyte*. *Cummins* 14. *Johnson* 812. *Dennett* 78. *Talb.* 1306 ; 1361. (See Appendix).

5. LASIODISCUS Hook. f.—F.T.A. 1 : 385.

Flowers in pedunculate cymes :
Branchlets and petioles pilose-hispid ; leaves opposite, elliptic, broadly acuminate, unequal-sided and cordate at the base, 7–12 cm. long, 4–6 cm. broad, thinly pilose on the nerves below or nearly glabrous ; lateral nerves 6–8 pairs, very prominent below, with slender subparallel tertiary nerves ; petiole about 5 mm. long ; cymes few-flowered, up to 8 cm. long ; flowers subumbellate ; pedicels about 7 mm. long, softly tomentellous ; young fruits truncate, broadly campanulate, tomentellous 1. *Chevalieri*
Branchlets and petioles more or less villous ; leaves more or less as above but not cordate, up to 20 cm. long and 10 cm. broad, shortly pubescent below ; lateral nerves about 9 pairs ; cymes lax, dichotomously branched ; pedicels about 4 mm. long, tomentose ; fruits depressed-globose, slightly trilobed, about 1·4 cm. diam., finely tomentellous .. .. 2. *Mannii*
Flowers in axillary fascicles ; branchlets and petioles pubescent ; leaves opposite, elliptic-obovate, long-acuminate, more or less narrowed at the base, 15–20 cm. long, 5–7 cm. broad, glabrous or slightly pubescent on the nerves below ; lateral nerves about 7–9 pairs, with subparallel tertiary nerves ; pedicels 3–4 mm. long, softly tomentose ; sepals 2·5 mm. long, tomentose .. .. .. 3. *fasciculiflorus*

1. **Lasiodiscus Chevalieri** *Hutch.* in Bull. Soc. Bot. France, Mém. 8d, 224 ; Chev. Bot. 137. A small tree up to about 30 ft. high ; flowers small golden-brown-tomentose.
Common in forests of Ivory Coast and Gold Coast ! Exsicc.—*Chev.* 19120 ; 22525 ; 22526. *Thompson* 51. *Chipp* 126.
2. **L. Mannii** *Hook. f.*—F.T.A. 1 : 385. A shrub, more or less climbing.
S. Nigeria : Eket ! ? Victoria ! Also in French Cameroons, Gabon, and in St. Thomas and Princes Islands. Exsicc.—*Talb.* 3238. *Preuss* 695a.
3. **L. fasciculiflorus** *Engl.* Bot. Jahrb. 40 : 550. A half-climbing shrub or a small tree ; inflorescence golden-brown-tomentose ; fruit ¼ in. diam., red and green
Common in Sierra Leone and Ivory Coast ! Also in French Cameroons. Exsicc.—*Thomas* 3106 ; 4190 ; 4228 ; 4233 ; 4309 ; 4826 ; 5189 ; 5193 ; 5810.

101. AMPELIDACEAE

Climbing shrubs or small trees or herbs from a perennial rootstock, with nodose or jointed stems, often with watery juice. Leaves alternate or the lower sometimes opposite, simple or digitately or bipinnately compound, often pellucid-punctate ; stipules usually present. Flowers hermaphrodite or unisexual, actinomorphic, small, in leaf-opposed spikes, racemes, cymes or panicles ; peduncles often cirrhose. Calyx small, entire or toothed. Petals 4–5, free or united, valvate. Stamens 4–5, opposite the petals. Disk present within the stamens. Ovary 2–6-celled, cells 1–2-ovuled ; style short. Fruit baccate. Seeds with copious sometimes ruminate endosperm and small embryo.

General in the tropics and warm temperate regions. Distinguished by the usually climbing habit with tendrils, the small flowers, valvate petals with the stamens opposite to them.

Leaves simple or digitately compound ; stamens free from each other ; ovary 2-celled, cells 2-ovuled :
Tendrils leaf-opposed, never borne on the inflorescence .. .. .. 1. **Cissus**
Tendrils borne on the inflorescence ; flowers polygamo-monoecious 2. **Ampelocissus**
Leaves bipinnate ; stamens united into a tube adnate to the base of the petals ; ovary 3–6-celled, cells 1-ovuled .. .. 3. **Leea**

1. CISSUS Linn.—F.T.A. 1 : 386 (under *Vitus*).

* Leaves simple, mostly toothed, rarely divided to below the middle :
† Leaves not lobed or only very slightly so :
Cymes pedunculate, peduncles fairly long :
§ Leaves more or less cordate or very broadly rounded at the base, mostly very broadly ovate or ovate-orbicular :
Leaves very jagged-toothed, with several ascending nerves from the base, quadrate-orbicular, broadly truncate or widely cordate at the base, about 7–9 cm. long, rather densely pilose below ; branchlets and inflorescence tomentose 1. *rubiginosa*

Leaves shortly toothed :
Leaves with petioles as long as the blade, like the stems glabrous ; blade ovate-pentagonal, 8–10 cm. long, widely cordate at the base, glabrous, minutely toothed .. .. 2. *petiolata*
Leaves with petioles considerably shorter than the blade :
Leaves conspicuously acuminate :
Leaves distinctly toothed :
Leaves pubescent on the nerves below, with numerous marked parallel tertiary nerves, ovate-pentagonal, 6–9 cm. broad ; flowers very numerous and small in open cymes .. .. 3. *polyantha*
Leaves glabrous below :
Leaves markedly and closely raised, venose-reticulate below, very widely ovate, acuminate, widely cordate, up to 15 cm. broad ; flowers small and rather numerous .. .. 4. *oreophila*
Leaves not markedly venose below :
Leaves rather thick and glaucous, about 12 cm. long and 10 cm. broad ; flowers small, numerous .. .. 5. *glaucophylla*

FIG. 166.—CISSUS PALMATIFIDA *Planch.* (AMPELIDACEAE).

A, flowering shoot. B, flower. C, longitudinal section of same. D, cross section of ovary. E, fruit. F, tendril.

Leaves thin, not glaucous, about 5–8 cm. long and 5 cm. broad ; flowers few 6. *arguta*
Leaves subentire or very obscurely toothed, broadly ovate-pentagonal, triangular-acuminate, widely cordate, 9–18 cm., braod glabrous, the main nerves radiating from the base ; flowers few in lax cymes .. .. .. 7. *populnea*
Leaves not acuminate, at most triangular-acute :
Leaves with few (about 8–12) teeth on each margin, ovate-triangular, widely truncate or subcordate at the base, thin, glabrous, 6–10 cm. broad ; stems succulent and quadrangular, constricted at the nodes ; flowers few in short cymes .. .. 8. *quadrangularis*
Leaves with numerous teeth on each margin :
Stems erect, short, from a succulent rhizome :
Petiole $\frac{1}{4}$–$\frac{1}{3}$ as long as the blade .. .. 9. *corylifolia*
Petiole very short, scarcely $\frac{1}{8}$ as long as the blade :
Leaves pubescent only on the nerves and veins .. 10. *pseudocaesia*
Leaves pubescent all over the lower surface .. .. .. 11. *Doeringii*
Stems scandent, terete, rather thick, glabrous ; leaves broadly ovate-orbicular, acute or shortly acuminate, 8–12 cm. broad, minutely denticulate, teeth setulose, slightly pubescent more or less all over the lower surface ; flowers umbellulate in lax cymes.. .. .. 12. *caesia*

§ Leaves narrowly rounded at the base, oblong or ovate-oblong :
Erect herb about 3 ft. high from a woody rootstock ; flowers in lax cymes on usually leafless shoots ; leaves ovate, acute, nearly entire, 7–8 cm. long, 4–5 cm. broad, glabrous or nearly so below ; petiole scarcely 1 cm. long .. .. 13. *cornifolia*
Slender climbers ; flowers on the leafy shoots :
Leaves very obscurely denticulate, broadly ovate-oblong, acuminate, 10–12 cm. long, 5–6 cm. broad, glabrous ; cymes very small .. .. .. 14. *Barteri*
Leaves markedly denticulate, oblong or oblong-lanceolate, acuminate, 8–12 cm. long, 3–4 cm. broad, glabrous ; cymes small but with rather numerous flowers 15. *producta*
Cymes sessile or subsessile, the flowers appearing to be subfasciculate in the leaf-axils ; leaves oblong or oblong-lanceolate, acutely acuminate, 6–10 cm. long, 2·5–3·5 cm. broad, remotely denticulate :
Leaves glabrous below .. .. 16. *Afzelii*
Leaves woolly-pubescent on the midrib below .. .. .. 17. *diffusiflora*
† Leaves digitately lobed nearly to the base, lobes often again deeply lobulate, dentate, shortly pubescent, especially on the veins below ; petiole pubescent ; flowers umbellulate in small lax cymes ; stems herbaceous, suberect .. 18. *palmatifida*
* Leaves digitately compound :
Leaves sessile ; trifoliolate ; leaflets obovate-oblanceolate or oblanceolate, 8–15 cm. long, 3–5 cm. broad, softly pubescent below, doubly crenate ; cymes very short and congested ; stems erect, scabrid .. .. 19. *crotalarioides*
Leaves petiolate :
Leaflets entire or very minutely, obscurely and distantly denticulate :
Herb with erect stems and densely tomentose leaflets .. .. 20. *Chevalieri*
Climbers with glabrous or nearly glabrous leaflets :
Cymes much shorter than the leaves ; leaflets oblong-obovate, rounded or shortly acuminate at the apex, cuneate into a fairly long petiolule at the base, 6–14 cm. long, 2–5 cm. broad, glabrous .. .. 21. *aralioides*
Cymes as long as or longer than the leaves :
Lateral leaflets on a common stalk forked above the middle ; leaflets elliptic, acuminate, slightly toothed, 4–7 cm. long, 2–3·5 cm. broad, very thin, glabrous ; cymes very slender and few-flowered .. .. 22. *debilis*
Lateral leaflets on separate stalks ; leaflets broadly obovate, long-cuneate, acutely acuminate, 6–10 cm. long, 3–5 cm. broad, pubescent on the nerves below ; cymes very lax on stout peduncles ; flowers numerous .. .. 23. *Vogelii*
Leaflets very distinctly toothed with usually numerous teeth or very undulate-toothed on the margin :
Leaflets linear to narrowly oblanceolate, rather long-attenuated to the gradually petiolulate base :
Leaflets about 7, not acuminate, rounded or subobtuse at the apex, cuneate at the base, 8–12 cm. long, 2·5–3·5 cm. broad, shortly pubescent only on the nerves below ; peduncle sometimes setose-glandular and tomentose ; cymes lax, about as long as the leaves .. .. 24. *serpens*
Leaflets gradually very acute or acuminate :
Stems glabrous ; cymes much longer than the leaves ; leaves shortly petiolate ; leaflets 3, linear-oblanceolate, acutely acuminate, 10–14 cm. long, up to 2·5 cm. broad, with few and sharp teeth .. .. 25. *stenopoda*
Stems pubescent :
Cymes longer than the leaves, lax-flowered ; stems bristly with gland-tipped hairs and also pubescent ; leaflets 3–5, narrowly oblanceolate, acutely acuminate, 7–9 cm. long, 1·5 cm. broad, jagged-toothed, pubescent on the veins below 26. *Lelyi*
Cymes shorter than the leaves, many-flowered ; stems bristly glandular ; stipules large, ovate-lanceolate, acuminate, 2·5 cm. long ; leaflets 3–5, oblanceolate, very acute, up to 16 cm. long and 3 cm. broad, coarsely toothed, thinly pubescent below .. .. 27. *crinita*
Leaflets broadly oblanceolate to obovate-orbicular, mostly abruptly contracted into the petiolulate or sessile base :
Leaflets quite sessile :
Herbs with erect stems :
Leaflets softly tomentellous below, oblong-lanceolate, 10–15 cm. long, 3–7 cm. broad, with numerous lateral nerves, strongly reticulate below .. 28. *flavicans*
Leaflets hairy on the nerves and veins below, obovate or oblong, shortly apiculate, 8–12 cm. long, 3·5–5 cm. broad, with 4–7 pairs of lateral nerves 29. *Zechiana*
Climber ; stems with numerous long slender purplish gland-tipped hairs ; leaflets obovate-oblanceolate, acute, 7–13 cm. long, 4–5 cm. broad, sharply toothed, nearly glabrous ; stipules persistent .. .. 30. *rubrosetosa*

Leaflets more or less petiolulate :
Leaflets not acuminate :
Leaflets crenately toothed :
Petiole and leaves softly tomentose ; leaflets obovate, rounded at the apex, about 6 cm. long, 3 cm. broad, obscurely toothed .. .. 31. *cymosa*
Petiole and leaves glabrous or nearly so ; leaflets broadly obovate, about 5 cm. long, coarsely crenate .. .. 32. *griseo-rubra*
Petiole and stems setose-glandular ; leaflets as above but narrower and less crenate .. .. 33. *lageniflora*
Leaflets repand-denticulate, teeth rather sharp :
Petiole and lower leaf-surface glabrous or nearly so ; leaflets oblong-elliptic, 4–7 cm. long, 2–3 cm. broad .. .. 34. *ibuensis*
Petiole and lower leaf-surface tomentellous ; leaflets obovate-oblanceolate, 6–8 cm. long, 2·5–3·5 cm. broad .. .. 35. *Bakeriana*
Leaflets conspicuously acuminate :
Petiolules up to 2·5 cm. long ; leaflets narrowed to the base :
Leaflets 5, the lateral pairs on a common stalk, more or less ovate, crenate-dentate :
Stipules ovate-lanceolate, persistent; unexpanded corolla cylindrical, much longer than broad .. .. 36. *adenocaulis*
Stipules small and deciduous ; unexpanded corolla short and subglobose 37. *gracilis*
Leaflets 3–5, separately stalked :
Branches and petioles with long slender gland-tipped hairs ; leaflets distantly crenate ; flower-buds very short, glabrous .. .. 38. *Rowlandii*
Branches and petioles without long (sometimes with very short) gland-tipped hairs :
Leaflets 5 :
Unexpanded corolla-bud elongate, about 3 times as long as broad, 5 mm. long, pubescent ; leaflets sharply crenate-serrate with very acute teeth 39. *Mannii*
Unexpanded corolla-bud slightly longer than broad, glandular-pubescent ; leaflets slightly serrate .. .. 40. *sokodensis*
Leaflets 3, coarsely dentate with triangular subobtuse teeth, softly pubescent below ; buds cylindric, much longer than broad, puberulous 41. *adenopoda*
Petiolules 4–5 cm. long ; leaflets rounded at the base, broadly elliptic-obovate, abruptly acuminate, 12–15 cm. long, 8–9 cm. broad, undulate, pubescent on the nerves ; flower-buds contracted in the middle, 2 mm. long 42. *ornata*

1. **Cissus rubiginosa** *Planch.* in DC. Monogr. Ampelid. 485 ; Gilg & Brandt in Engl. Bot. Jahrb. 46 : 475. *Vitis rubiginosa* Welw.—F.T.A. 1 : 394. Undershrub with wide-climbing densely rusty-tomentose stems, small flowers in compound cymes, and berry-like pointed fruit ½ in. long.
Togo : Bismarckburg, at the Jege stream. N. Nigeria : Bauchi Plateau, Mongu, 4,300 ft. (fr. July) ! In gallery woods of savannah districts throughout tropical Africa. Exsicc.—*Lely* 388.
2. **C. petiolata** *Hook. f.* in Niger Fl. 262 ; Gilg & Brandt l.c. 464 (incl. syn.). *Vitis Welwitschii* Bak.—F.T.A. 1 : 393. A glabrous woody climber with tetragonal stems becoming corky with age ; fruit ½ in. long, reddish when ripe.
Gold Coast : Akwapim. Togo : Lome. S. Nigeria : Victoria. Extends to Abyssinia and Eritrea, Congo, Uganda and Angola.
3. **C. polyantha** *Gilg & Brandt* l.c. 467. *Vitis glaucophylla* Bak.—F.T.A. 1 : 392, partly. A half-woody climber with subterete brown-pubescent branches becoming glabrous.
Sierra Leone. Liberia : Grand Bassa (Sept.) ! Togo : Misahöhe. Dahomey : Mts. Atacora, Kouandé (June) ! S. Nigeria : Epe ! Lagos ! Oban ! Calabar (Aug.) ! Extends to Chad area and Lower Congo. Exsicc.—*Afzelius*. *Barter* 3277. *Holl.* 76. *MacGregor* 190. *Talb.* 562, partly. *Dinklage* 1671. *Chev.* 24007.
4. **C. oreophila** *Gilg & Brandt* l.c. 471. *Vitis glaucophylla* Bak.—F.T.A. 1 : 392, partly. A more or less woody climber with glabrous subterete stems.
Cameroons Mt., 4,500 ft. (Feb.) ! Buea, climbing on trees in the mountain forest. Exsicc.—*Mann* 1279.
5. **C. glaucophylla** *Hook. f.* in Fl. Nigrit. 263 ; Gilg & Brandt l.c. 471. *Vitis glaucophylla* Bak.—F.T.A. 1 : 392, partly. A glabrous, more or less glaucous woody climber with obscurely tetragonal stems.
Sierra Leone. Fernando Po : Clarence Cove (Nov.) ! Exsicc.—*Afzelius*. *T. Vogel* 101.
6. **C. arguta** *Hook. f.* in Niger Fl. 261. *Vitis arguta* Bak.—F.T.A. 1 : 392. *V. uvifera* Bak.—F.T.A. 1 : 391, not of Afz. *C. producta* Gilg & Brandt l.c. 477, partly, not of Afz. A glabrous more or less woody climber with obscurely angled stems and fruit like small grapes, ¼ in. long.
Sierra Leone : near Mofari ! Freetown ! S. Nigeria : Ibo, etc. (Aug., Sept.) ! Lagos and environs, fairly common ! Oban ! Fernando Po (Nov.) ! Also in French Cameroons. Exsicc.—*T. Vogel* 3 ; 106 ; 141 ; 233. *Sc. Elliot* 4404. *Millen* 30 ; 77 ; 124. *Dalz.* 1148 ; 1414. *Talb.* 562, partly.
7. **C. populnea** *Guill. & Perrott.* Tent. Fl. Seneg. 1 : 134 ; Gilg & Brandt l.c. 463 ; Chev. Bot. 145. *Vitis pallida* Bak. F.T.A. 1 : 393, partly, not of W. & A. ; Holl. 1 : 164. A lofty climber with stout glabrous softly woody stems, green and turning whitish with age ; fruits grape-like, nearly 1 in. long, with a bloom and turning blackish purple when ripe.
From French Sudan and Senegal to French Cameroons, and extending to Abyssinia, East Africa, and Uganda. Exsicc.—*Barter* 1276. *Rowland*. *Dalz.* 79. *Chipp* 480 ; 742. *Warnecke* 315. (See Appendix).
8. **C. quadrangularis** *Linn.* Mant. 39 ; Gilg & Brandt l.c. 481 ; Chev. Bot. 146. *Vitis quadrangularis* Wall.—F.T.A. 1 : 399 ; Holl. 1 : 164. A glabrous lofty climber with stout succulent quadrangular and almost winged stems, leafy only on the young shoots ; fruits glabrous, ½ in. long, red when ripe.
Common especially throughout the drier regions of tropical Africa, extending to Arabia, India, etc. Exsicc.—*Barter* (no number). *Elliott* 164. *Dalz.* 80 ; 8039. *Deveaux* 163. (See Appendix).

9. **Cissus corylifolia** *Planch.* l.c. 484; Gilg & Brandt l.c. 473; Chev. Bot. 142. *Vitis corylifolia* Bak.—F.T.A. 1: 396. An erect little-branched coarsely brown-pubescent plant with broad leaves (sometimes nearly 1 ft. in diam.), arising from a woody rhizome; inflorescence red-tinged; fruit ovoid or pear-shaped, ¼ in. long, turning black.
French Guinea: common on savannah plateaux. Ivory Coast: Upper Sassandra, Toura country; Mankono. Gold Coast: Afram Plains (Mar.)! Togo: Sokode. Dahomey: Savalou; Djougou. N. Nigeria: Nupe! Abinsi (Apr., May)! Nabardo, 2,300 ft. (May)! Also in N. Cameroons. Exsicc.—*Barter* 1271. *Johnson* 704. *Dalz.* 673. *Lely* 207.

10. **C. pseudocaesia** *Gilg & Brandt* l.c. 473. In habit like the last, with yellowish-brown pubescence becoming glabrous.
Sierra Leone: Falaba, Ninia, up to 4,000 ft. (Feb.)! Dahomey: Mts. Atacora, Somba country, between Kouba and Farfa (June)! Exsicc.—*Sc. Elliot* 4907. *Chev.* 24030.

11. **C. Doeringii** *Gilg & Brandt* l.c. 473. Like the preceding, yellowish-brown-tomentose on the young parts; fruit ½ in. long, blue-black when ripe.
French Guinea: Mamou (Mar.)! Gold Coast: Techeri, West Prov. Ashanti (June)! Togo: Misahöhe, common in open or woodland savannah (May)! Atakpame. Exsicc.—*Dalz.* 8392. *Chipp* 476. *Baumann* 30.

12. **C. caesia** *Afzel.* Remed. Guin. 55: Gilg & Brandt l.c. 474; Chev. Bot. 141. *C. rufescens* Guill. & Perrott.; Gilg & Brandt l.c. *Vitis caesia* Don—F.T.A. 1: 396; Holl. 1: 163. Stems softly woody, wide-climbing or ground-trailing; inflorescence red-tinged; fruit pear-shaped, ½ in. long, black when ripe.
Gambia! French Guinea: ? locality! Sierra Leone: common! Togo. N. Nigeria: Nupe!

13. **C. cornifolia** *Planch.* l.c. 492; Gilg & Brandt l.c. 480. *Vitis cornifolia* Bak.—F.T.A. 1: 390; Holl. 1: 163. Shoots rusty-tomentose, stout, suberect from a woody base after bush fires, flowering when leafless; fruits black-purple, ½ in. long, pointed.
N. Nigeria: Nupe! Lokoja! Zaria (Feb.)! Extends to E. Sudan, Abyssinia, Nile Land and S. Africa. Exsicc.—*Barter* 1072. *Dalz.* 420. (See Appendix).

14. **C. Barteri** *Planch.* l.c. 491; Gilg & Brandt l.c. 476. *Vitis Barteri* Bak.—F.T.A. 1: 390. Stem wide-climbing, glabrous, half succulent.
S. Nigeria: Victoria; Johann-Albrechtshöhe. Fernando Po! Extends to Lower Congo. Exsicc.—*Barter* (no number). *Mann* 11.

15. **C. producta** *Afzel.* Remed. Guin. 63; Gilg & Brandt l.c. 477, partly; Stapf 590; Chev. Bot. 145. *Vitis producta* Bak.—F.T.A. 1: 389. An extensive climber with glabrous, more or less angled, half-succulent stems, and grape-like fruits ½ in. long, reddish when ripe.
From French Guinea to French Cameroons and Fernando Po, extending to St. Thomas Island, Congo, and to E. Sudan and E. Africa. Exsicc.—*Afzelius. Barter* 3258. *Mann* 273. *Whyte. Brown* 314. *Johnston* 25. *Collenette* 24. (See Appendix).

16. **C. Afzelii** *Gilg & Brandt* l.c. 478; Chev. Bot. 140. *Vitis Afzelii* Bak.—F.T.A. 1: 389. A climber with brownish-pilose stems, not very stout and scarcely woody.
French Guinea: Kouria and environs (Aug.)! Sierra Leone: Freetown, Lester Peak (fr. Dec.)! Njala (Sept.)! S. Nigeria: Johann-Albrechtshöhe. Extends to Congo and E. Sudan. Exsicc.—*Afzelius. Don. Sc. Elliot* 3830. *Deighton* 2134. *Chev.* 15065.

17. **C. diffusiflora** *Planch.* l.c. 496; Gilg & Brandt l.c. 479. *Vitis diffusiflora* Bak.—F.T.A. 1: 390. Stem slender, zigzag, with rusty brown tomentum.
S. Nigeria: Lagos! Oban! Fernando Po (Nov.)! Also in French Cameroons and Gabon. Exsicc.—*Mann* 570. *Millen* 28. *Talb.* 755.

18. **C. palmatifida** *Planch.* l.c. 473; Gilg & Brandt l.c. 484; Chev. Bot. 145. *Vitis palmatifida* Bak.—F.T.A. 1: 397; Holl. 1: 164. Stems suberect at first, then trailing or climbing, finely striate, often red-purple-tinged, villous when young; berries black like currants.
French Sudan: rocky hills of Sindou and Fo; Koulikoro. French Guinea: Kankan. Gold Coast: Salaga! Kintampo (Mar.)! Dahomey: Agouagon to Savé (May)! Mts. Atacora, common. N. Nigeria: Nupe! Abinsi, common in woods (Apr.)! Yola (June)! S. Nigeria: Olokemeji! Extends through Shari-Chad to E. Sudan. Exsicc.—*Barter* 974; 1278. *Dalz.* 44; 65; 678. *Foster* 292. *Krause.* (See Appendix).

19. **C. crotalarioides** *Planch.* l.c. 577; Gilg & Brandt l.c. 498. Stems herbaceous, erect, 3–4 ft. high, brownish-yellow-tomentellous, from a thickened rootstock.
N. Nigeria: Nupe! Bauchi Plateau: Naraguta! Nabardo (May)! Extends to N. Cameroons and Shari-Chad; also in Congo region and Nyasaland. Exsicc.—*Barter* 1689. *Lely* 72; 610.

20. **C. Chevalieri** *Gilg & Brandt* l.c. 508; Chev. Bot. 141. Erect, herbaceous, 1–2 ft. high, from a woody base with grooved stems rather densely pilose with glandular hairs.
French Sudan: Koba, in dry bush; between Dieguessikalana and Kémené (Mar.). Senegal: Kaolak. French Guinea: Futa Jallon, Timbo, Ditinn, Dalaba-Diaguissa Plateau (Sept.). Ivory Coast: Mankono (June). Exsicc.—*Chev.* 18378, etc. (See Appendix).

21. **C. aralioides** *Planch.* l.c. 513; Gilg & Brandt l.c. 485. *Vitis aralioides* Welw.—F.T.A. 1: 411; Holl. 1: 163. *V. constricta* Bak.—F.T.A. 1: 409; Chev. Bot. 142. A lofty climber, woody at the base, with stout succulent terete stems constricted at the nodes, and sometimes subsucculent leaves; flowers whitish, comparatively large; fruit ½–1 in. long, reddish turning blue-purple.
Sierra Leone: Regent (fr. Feb.)! Liberia: Careysburg. Gold Coast: Aburi Hills (Oct.)! Togo: Sokode-Basari; near Jege, Bismarckburg. N. Nigeria: Nupe! S. Nigeria: Lagos (Oct.)! Nun R. (Sept.)! Also in St. Thomas and Princes Islands, and extending to E. Sudan and East Africa. Exsicc.—*Barter* (no number). *Mann* 503. *Johnston* 84. *Johnson* 458. *Dalz.* 1147. *Imp. Inst.* 30472 (1909). (See Appendix).

22. **C. debilis** *Planch.* l.c. 569; Gilg & Brandt l.c. 486. *Vitis debilis* Bak.—F.T.A. 1: 403. A slender climber with glabrous grooved almost quadrangular stems and very small flowers and fruits.
S. Nigeria: Oban! Victoria; Barombi. Fernando Po (June)! Also in French Cameroons and St. Thomas Island, and extending to Angola. Exsicc.—*Mann* 412. *Talb.* 407.

23. **C. Vogelii** *Hook. f.* Fl. Nigrit. 267; Gilg & Brandt l.c. 531. *Vitis Vogelii* Bak.—F.T.A. 1: 409. An extensive climber, setose on the younger parts, the leaves and stems often purple-tinged, the fruits small, black when ripe.
Sierra Leone: Scarcies R. (Jan.)! Gold Coast: Kumasi! N. Nigeria: Nupe! S. Nigeria: Lagos, Ebute Metta. Ossidinge; Johann-Albrechtshöhe. Cameroons Mt. (Jan.)! Fernando Po, on the beach! Also in French Cameroons and Spanish Guinea. Exsicc.—*T. Vogel* 24. *Barter* 1274. *Sc. Elliot* 4278. *Cummins* 151. *Millen* 36. *MacGregor* 254. *Dunlap* 94.

24. **C. serpens** *Hochst.* ex A. Rich. Flor. Abyss. 1: 111; Gilg & Brandt l.c. 527. *Vitis serpens* Hochst.—F.T.A. 1: 412. An extensive climber with finely grooved stems clothed with grey glandular pubescence; fruits puberulous, about ¼ in. long.
N. Nigeria: Katagum, on bushes (Sept.)! Extends to E. Sudan, Abyssinia and Eritrea. Exsicc.—*Dalz.* 77.

25. **C. stenopoda** *Gilg* in Schlechter Westafr. Kautschuk-Exped. 298, and in Engl. Bot. Jahrb. 46: 490. A glabrous herb up to 3 ft. high from a thickened succulent base.
Gold Coast: Salaga (Apr.)! Togo: Quamikrum. N. Nigeria: Bare! Exsicc.—*Barter* 3436. *Krause.*

26. **C. Lelyi** *Hutch.* in Kew Bull. 1921: 361. Herbaceous, climbing or trailing, several feet long, with greenish-white flowers.
N. Nigeria: Bauchi Plateau, top of Zarande Mt., 5,800 ft. Exsicc.—*Lely* 194.

27. **C. crinita** *Planch.* l.c. 581; Gilg & Brandt l.c. 494; Chev. Bot. 143. Stems herbaceous, erect from a half-succulent woody base; inflorescence deeply red-tinged; fruits black.

French Sudan: Gourma. Ivory Coast: valley of Middle Nzi. Dahomey: Savalou, Pira, Cabolé, Bassila (May); Birni to Kouandé. N. Nigeria: Abinsi (Oct.)! Also in E. Sudan. Exsicc.—*Dalz.* 674.

28. **C. flavicans** *Planch.* l.c. 591; Gilg & Brandt l.c. 505. *Vitis flavicans* Bak.—F.T.A. 1: 413. Habit of the preceding, with stems angular and grooved, grey-tomentose and setose when young, up to 5 ft. high; flowers numerous in much-branched long-stalked broad cymes; fruits turbinate, crimson, densely setose, ¼ in. long.

N. Nigeria: Yoruba country! Exsicc.—*Barter* 912; 1271.

29. **C. Zechiana** *Gilg & Brandt* l.c. 506. Habit of the two preceding, woody below, with grooved stems constricted at the nodes (when dry), clothed densely with short hairs mixed with glandular hairs; flowers numerous in much-branched shortly stalked cymes, purple-tinged; fruits pilose and glandular, reddish and glabrescent when ripe.

Togo: Keti Kratchi. Exsicc.—*Zech.* 363.

30. **C. rubrosetosa** *Gilg & Brandt* l.c. 532. Herbaceous lofty climber with striate rather bristly stems, long-stalked ample cymes, and small glabrous fruits.

Togo: Sokode-Basari, near Bagu; near Aledjo; Bismarckburg, near Jege. Also in N. Cameroons and French Congo. Exsicc.—*Kersting* 309; 381. *Buettner* 114.

31. **C. cymosa** *Schum. & Thonn.* Plant. Guin. 82; Gilg & Brandt l.c. 537. *Vitis Thonningii* Bak.—F.T.A. 1: 407, partly. Herbaceous climber with branches grey-tomentose glandular when young, flowers in branched cymes on peduncles 2–3 in. long, and fruit pubescent, ¼ in. long.

Gold Coast: Accra! Exsicc.—*T. Vogel* 35.

32. **C. griseo-rubra** *Gilg & Brandt* l.c. 46: 528. A climber with characters like the last.

Togo: Lome, common. Exsicc.—*Warnecke* 365.

33. **C. lageniflora** *Gilg & Brandt* l.c. 537. A climber, the stems, etc., pubescent and provided with spreading gland-tipped hairs.

French Guinea: Kouria and environs (Oct.)! Exsicc.—*Caille* ex *Herb. Chev.* 14974.

34. **C. ibuensis** *Hook. f.* Fl. Nigrit. 265; Gilg & Brandt l.c. 486; Chev. Bot. 144. *Vitis ibuensis* Bak.—F.T.A. 1: 402. *V. intricata* Bak.—F.T.A. 1: 404. A climber with rather deeply striate stems, pubescent when young, branches and leaves slightly succulent, cymes on peduncles 4–6 in. long, and smooth fruit ⅛–½ in. long.

Sierra Leone: Sulimania (Mar.)! Togo: Bismarckburg. Ivory Coast: rank in the forests, Agniéby Valley, Capiécrou, and between Middle Sassandra and Middle Cavally. N. Nigeria: Nupe! Yola (July)! S. Nigeria: Nun R.! Ibo! extending to E. Sudan, Uganda, East Africa and Lower Congo. Exsicc.—*T. Vogel* 13; 37. *Barter* 1133. *Sc. Elliot* 5305. *Dalz.* 58.

35. **C. Bakeriana** *Planch.* l.c. 599; Gilg & Brandt l.c. 543. *Vitis Thonningii* Bak.—F.T.A. 1: 407, partly. A climber, the stems, etc., grey-tomentellous and also glandular; fruits glandular-pubescent, ¼ in. long, turning red.

N. Nigeria: Nupe! Exsicc.—*Barter* 101.

36. **C. adenocaulis** *Steud.* ex *A. Rich.* Fl. Abyss. 1: 111; Gilg & Brandt l.c. 516; Chev. Bot. 140. *Vitis tenuicaulis* Bak.—F.T.A. 1: 404, partly; Chev. Bot. 147. A nearly glabrous climber with deeply striate stems, along with the leaves half succulent; inflorescence reddish in bud; fruits glabrous, ¼ in. long.

From Senegal and French Sudan to French Cameroons, extending to the Red Sea, East Africa, and Angola. Exsicc.—*Barter* 1272. *Dalz.* 59. *Shaw* 64. *Lely* 224. *Chev.* 24728. (See Appendix).

37. **C. gracilis** *Guill. & Perrott.* Fl. Seneg. 1: 134; Gilg & Brandt l.c. 487; Chev. Bot. 144. *Vitis gracilis* Bak.—F.T.A. 1: 404. A slender climber with glabrous angular grooved stems, very small flowers in glabrous cymes on peduncles 1–4 in. long, and black currant-like fruits.

French Sudan: Segou. Senegal. French Guinea: Futa Jallon, near Timbo. Sierra Leone: Freetown (June)! Ivory Coast: Sanir. Liberia: Gbanga! Gold Coast: Aburi (June, July)! Togo: Lome; Sokode-Basari; Bagu. N. Nigeria: Katagum (Sept.)! Camerooons Mt.: Buea. Fernando Po! Widely spread in tropical Africa to Transvaal and Natal. Exsicc.—*T. Vogel* 77. *Mann* 1167. *Brown* 315. *Johnson* 975. *Dalz.* 78. *Linder* 764. (See Appendix).

38. **C. Rowlandii** *Gilg & Brandt* l.c. 523. A herbaceous climber with striate stems and very slender cymes of small flowers.

S. Nigeria: Lagos Colony (Aug.)! Exsicc.—*Rowland.*

39. **C. Mannii** *Planch.* l.c. 610; Gilg & Brandt l.c. 530. *Vitis Mannii* Bak.—F.T.A. 1: 412. A climber with glabrous grooved stems and flowers in pubescent lax cymes on peduncles 3–6 in. long.

Cameroons Mt., in forest from Buea up to 7,000 ft. Also in N.W. Cameroons. Exsicc.—*Mann* 1989.

40. **C. sokodensis** *Gilg & Brandt* l.c. 506. Stems herbaceous, erect, up to 3 ft. high, from a woody base, constricted above the nodes (when dry), striate, like the inflorescence grey-pilose as well as glandular-pubescent.

Togo: Sokode-Basari; Aledjo, 2,500 ft. Exsicc.—*Kersting* 303.

41. **C. adenopoda** *Sprague* in Kew Bull. 1906: 247. A herbaceous climber with tuberous root, all the parts more or less spreading-pubescent and with a few gland-tipped hairs; young foliage bright red; fruits glabrous, blackish, nearly ¼ in. long.

Togo: Misahöhe, in forest. S. Nigeria: Victoria and vicinity. Also in French Cameroons, E. Sudan and Uganda. Exsicc.—*Baumann* 488. *Winkler* 127.

42. **C. ornata** *A. Chev.* 144, name only. A rather stout half-woody climber with glabrous stems.

Ivory Coast: Azagulé (Sept.)! Exsicc.—*Chev.* 22276.

2. AMPELOCISSUS Planch. in Journ. Vigne Am. 374 (1884), and in DC. Monog. Ampelid. 368.

Leaves simple, sometimes lobed to beyond the middle:

Leaves not lobed or only very shortly so:

Leaves nearly glabrous below or pubescent only on the nerves:

Flowers in very small and rather few-flowered cymes; leaves pentagonal-orbicular, deeply cordate, subacute, 8–12 cm. diam., denticulate .. .. 1. *Grantii*

Flowers in large many-flowered cymes or panicles of cymes:

Inflorescence a pyramidal panicle; petiole and nerves glabrous or nearly so; leaves distantly dentate .. .. 2. *macrocirrha*

Inflorescence a spreading cyme; petiole and nerves hairy; leaves closely dentate 3. *gracilipes*

Leaves more or less densely tomentose below:

Stems and petioles more or less densely furnished with long glandular bristles; leaves large, widely orbicular, about 15–25 cm. broad, often lobulate, doubly dentate, soon becoming rather thinly woolly-pubescent .. .. 4. *Bakeri*

Stems and petioles not bristly or rarely very slightly so; leaves smaller than above:

Stems and petioles glabrous or thinly woolly, rarely with a few short bristles; leaves broadly ovate, acute, cordate, about 8–10 cm. broad:
Leaves permanently and rather densely woolly-tomentose below with cinnamon-coloured hairs .. .. 5. *salmonea*
Leaves from the beginning thinly woolly-pubescent .. .. 9. *bombycina*
Stems and petioles densely covered with very short hairs; leaves covered below with dense grey hairs .. .. 6. *Lecardii*
Stems and petioles densely covered with a mat of woolly bright cinnamon-red hairs; leaves broadly ovate-orbicular, sometimes shortly trilobed, about 15 cm. broad, woolly-tomentose below with cinnamon hairs .. 7. *cinnamochroa*
Leaves deeply lobed to or beyond the middle:
Leaves thinly woolly all over the lower surface:
Leaves 15 cm. or more broad; stems and petioles more or less bristly; inflorescence long-pedunculate, fairly large .. .. 8. *leonensis*
Leaves up to about 10 cm. broad; stems and petioles woolly; inflorescence shortly pedunculate, small and few-flowered .. .. 9. *bombycina*
Leaves pubescent only on the nerves below .. .. 1. *Grantii*
Leaves compound, digitately 5-foliolate; leaflets obovate-oblanceolate, acutely acuminate, cuneate at the base into a short petiolule, 10–12 cm. long, up to 6 cm. broad, distantly serrate-dentate, nearly glabrous below; inflorescence puberulous 10. *pentaphylla*

1. **Ampelocissus Grantii** *Planch.* l.c. 394; Gilg & Brandt in Engl. Bot. Jahrb. 46: 428. *A. gourmaensis* A. Chev. Bot. 139, name only. *A. Chantinii* Planch.; Chev. Bot. 139. *Vitis Grantii* Bak.—F.T.A. 1: 400. *V. asarifolia* Bak.—F.T.A. 1: 396. A strong climber with stems often slightly woolly when quite young, soon glabrous, and a thickened half-succulent root; inflorescence often red-tinged; fruits blackish, about ½ in. long, like small grapes.
Fairly common from Senegal and French Sudan to French Cameroons but only in the interior, extending to E. Sudan, Uganda and East Africa. Exsicc.—*Dalz.* 63; 64; 354. *Lamb* 105. *Poboguin* 702. *Chev.* 24742, etc. (See Appendix).

2. **A. macrocirrha** *Gilg & Brandt* l.c. 424, fig. 1, A. A climber with stout woody glabrous stems and strong branched tendrils.
S. Nigeria: Johann-Albrechtshöhe, by the lake; Cameroons Mt., Buea. Fernando Po (Jan.)! Also in French Cameroons. Exsicc.—*Mann* 226.

3. **A. gracilipes** *Stapf* in Journ. Linn. Soc. Bot. 37: 90; Gilg & Brandt l.c. 425. A climber with softly woody stout stems, pale brownish-tomentellous on the young parts; flowers reddish, very small; fruit about ¼ in. long, red, glabrous.
Liberia: Sino Basin! Grand Bassa, River Cestos, near the coast. Gold Coast: Akwapim (fr. June)! Exsicc.—*Whyte. Rumsey* 9.

4. **A. Bakeri** *Planch.* in Journ. Vigne Amér. 1885: 30; Gilg & Brandt l.c. 426; Chev. Bot. 138. *Vitis Schimperiana* Hochst.—F.T.A. 1: 395, partly; Holl. 1: 165. A woody vine with densely brown hairy stems, leaves often very large, pale- or red-ochrey below, reddish inflorescence, and grape-like fruit, smooth, ½ in. long.
Dahomey: Savalou, between Pira and Cabolé (May)! N. Nigeria: Yoruba country! Abinsi (July)! Katsina Allah! Exsicc.—*Barter* 1275; 1279. *Dalz.* 675; 676. *Lamb* 106. (See Appendix).

5. **A. salmonea** *Planch.* l.c. 31; Gilg & Brandt l.c. 426; Chev. Bot. 139. *Vitis salmonea* Bak.—F.T.A. 1: 394. An extensive herbaceous climber, the stems, etc., at first clothed with grey or reddish down and purple setae; flowers small, dark-coloured, in very dense cymes on peduncles 1–2 in. long.
French Sudan: Nafadié. French Guinea: Futa Jallon, several localities. Sierra Leone: Freetown! Ivory Coast: Upper Sassandra, Toura country. Togo: Sokode-Basari; Aledjo. Dahomey: Savalou, between Cabolé and Bassila. S. Nigeria: Lagos! Lagos Colony! below Buea (Feb.)! Also in French Cameroons. Exsicc.—*Barter* (no number). *Millson* 53. *MacGregor* 96. *Dennett* 501. *Dalz.* 8231.

6. **A. Lecardii** *Planch.* in Journ. Vigne Amér. 1885: 29; Gilg & Brandt l.c. 425; Holl. 1: 163 (as *Vitis Lecardii* Carriere).
Senegal: Bafing barrage. Exsicc.—*Lecard* 128.

7. **A. cinnamochroa** *Planch.* l.c. 31; Gilg & Brandt l.c. 431. *Vitis leonensis* Bak.—F.T.A. 1: 398, partly. *Ampelocissus leonensis* Planch., partly. An extensive climber with rather stout half-woody stems and crowded inflorescence of small blackish-purple flowers.
French Guinea: Kouroussa, common (July)! Gold Coast: Salaga! Togo: Lome; Misahöhe; Sokode-Basari, in savannah; Aledjo, on rocks. Dahomey: Allada, La Lama (Mar.)! Also in French Cameroons, Spanish Guinea and E. Sudan. Exsicc.—*Krause. Poboguin* 349. *Chev.* 23263.

8. **A. leonensis** *Planch.* l.c. 30; Gilg & Brandt l.c. 427; Chev. Bot. 139. *Vitis leonensis* Bak.—F.T.A. 1: 398, partly; Holl. 1: 164. A lofty climber with stout but scarcely woody stems, pubescent and with purple setae, the leaves with yellowish-grey or salmon-coloured tomentum below; fruit smooth, red, ½ in. long.
French Guinea: Farana and neighbourhood; Rio Nunez and Rio Pongos. Sierra Leone: Freetown (June)! Bagroo R. (Apr.)! Kafogo, Limba (Apr.)! N. Nigeria: Nupe! Exsicc.—*T. Vogel* 10. *Barter* 1276. *Mann* 865. *Sc. Elliot* 5614. (See Appendix).

9. **A. bombycina** *Planch.* l.c. 31; Gilg & Brandt l.c. 431; Chev. Bot. 138. *Vitis bombycina* Bak.—F.T.A. 1: 399; Holl. 1: 163. An extensive climber with half-woody stems, reddish-woolly, with small deep red flowers and small round smooth fruits.
French Guinea: Futa Jallon, Timbo area. Ivory Coast: several localities. Togo: Lome! N. Nigeria: Nupe! Katsina Allah (Aug.)! Yola, on rocks (June)! Rinjim Mukr. 2,500 ft. (May)! Extends by N. Cameroons to E. Sudan. Exsicc.—*Barter* 1277. *Dalz.* 61; 677. *Lely* 223. *Warnecke* 346.

10. **A. pentaphylla** *Gilg & Brandt* l.c. 427. *Vitis pentaphylla* Guill. & Perrott. Tent. Fl. Seneg. 1: 135, t. 33. *V. multistriata* Bak.—F.T.A. 1: 410. Stems widely climbing, more or less woody, finely striate, glabrous; inflorescence crowded, reddish; fruits smooth, grape-like, about ½ in. long.
French Sudan: Kaledougou. Senegal: Karkandy! Kaolak. Gambia: Albreda (Dec.)! Abuko (Jan.)! N. Nigeria: Nupe! Yola (June)! extending by N. Cameroons and Shari to E. Sudan. Exsicc.—*Heudelot* 860. *Barter* 1280. *Ingram. Dalz.* 62; 8040. (See Appendix).

Imperfectly known species.

A. atacorensis *A. Chev.* Bot. 138.
Dahomey: Atacora Mts. (June). Exsicc.—*Chev.* 24125.

3. LEEA Linn.—F.T.A. 1 : 415.

Leaves bipinnate ; leaflets opposite, imparipinnate, oblong-elliptic, acuminate, rounded or slightly narrowed at the base, up to 18 cm. long and 8 cm. broad, glabrous, crenate-serrate ; petiolules about 5 mm. long ; cymes leaf-opposed, large and spreading ; calyx cupular, 5-lobed ; petals 5, glabrous, short ; stamens 5 ; filaments united in a tube ; fruit depressed, 5–8-lobulate, nearly 1 cm. in diam., glabrous

guineensis

L. guineensis *Don* Gen. Syst. 1 : 712 ; Stapf 590. *L. sambucina* Bak.—F.T.A. 1 : 415 ; Holl. 1 : 165 ; Chev. Bot. 147, not of Willd. An erect or suberect soft wooded shrub, up to 8 ft. high, without tendrils, with bright yellow and red flowers and brilliant red fruits eventually turning black.

In forest and moister woodlands throughout the area, and all over tropical Africa ; also in the Mascarene Islands. Exsicc.—*T. Vogel* 11 ; 75 ; 92 ; 168. *Irving*. *Barter* 1754. *Mann* 49. *Sc. Elliot* 3923. *Cummins* 140. *Whyte*. (See Appendix).

102. RUTACEAE

Shrubs or trees, rarely herbs. Leaves simple or compound, mostly gland-dotted ; stipules absent. Flowers hermaphrodite or unisexual, actinomorphic. Sepals 4–5, imbricate, free or connate. Petals imbricate, rarely valvate, mostly free. Stamens the same or double the number of the petals, rarely numerous, free or rarely united ; anthers 2-celled, introrse, opening lengthwise. Disk usually present within the stamens. Ovary superior, syncarpous and often 4–5-celled, or the carpels free (secondary apocarpy) ; styles free or connate. Ovules often 2, superposed. Fruit baccate, drupaceous or coriaceous, rarely a capsule. Seeds with or without endosperm.

Readily recognised by the gland-dotted usually compound leaves.

Excluded genus : *Eriander* H. Winkl. (*E. Engleri*) = *Oxystigma Mannii* Harms. (*Caesalpiniaceae*).

Leaves pinnate (more than 5-foliolate) :
- Flowers hermaphrodite ; carpels united in fruit .. .. 1. **Clausena**
- Flowers unisexual ; carpels separate in fruit .. .. 2. **Fagara**

Leaves trifoliolate or rarely 5-foliolate or simple :
- Leaf-rhachis or petiole not winged or only very slightly so :
  - Leaves trifoliolate :
    - Carpels united or ovary of 1 carpel :
      - Stamens about 20 ; flowers hermaphrodite .. .. 3. **Afraegle**
      - Stamens 4–5 ; flowers polygamous .. .. 4. **Teclea**
    - Carpels 2–4, free or nearly so .. .. 5. **Oricia**
  - Leaves simple ; stamens 8–10 ; ovary 5–6-celled ; fruit with 5–6 3-angled cells and shining seeds .. .. 6. **Aeglopsis**
- Leaf-rhachis with a broad leafy wing between the leaflets ; branchlets usually armed with spines ; flowers in axillary clusters ; stamens 8–10 ; ovary 4-5-celled, with 1 ovule in each cell .. .. 7. **Citropsis**

1. CLAUSENA Burm.—F.T.A. 1 : 307.

Leaflets more or less pubescent below, especially on the nerves, alternate, obliquely ovate or ovate-lanceolate, very variable in size, up to about 8 cm. long and 5 cm. broad, glandular-punctate, entire or crenulate ; panicles lax, 15–20 cm. long ; pedicels pubescent ; petals glabrous ; fruits ellipsoid, about 8 mm. long .. 1. *anisata*

Leaflets glabrous below, alternate, obovate-elliptic, the end one obovate and about 12 cm. long and 5 cm. broad, crenate ; panicles very short and shortly branched ; pedicels slightly puberulous ; petals glabrous ; fruits obovoid, stipitate, about 8 mm. long .. .. 2. *inaequalis*

1. **C. anisata** *Oliv.*—F.T.A. 1 : 308 ; Chev. Bot. 101. An undershrub up to 6–7 ft. high with odorous leaves, cream-white flowers and shining black drupe fruits.

Common from Sierra Leone to S. Nigeria, and extending to Angola, E. Sudan, Uganda and East Africa. Exsicc.—*T. Vogel* 5 ; 85. *Irving* 23 ; 88. *Barter* 1638 ; 3339. *Sc. Elliot* 4146 ; 5487 ; 5666 ; 5685. *Rowland*. *MacGregor* 55. *Talb.* 1500. (See Appendix).

2. **C. inaequalis** *Benth.*—F.T.A. 1 : 307 ; Chev. Bot. 102. A shrub or small tree 15–20 ft. high.

French Guinea : Farana (May). Ivory Coast : North Baoulé (July). Cameroons Mt. : 7,500 ft. (Feb.) ! Extends to E. and S. Africa. Exsicc.—*Mann* 1187.

2. FAGARA Linn.—F.T.A. 1 : 304, as *Xanthoxylum* Linn.

Leaflets not acuminate or only very slightly so, rigidly papery, oblong or oblong-oblanceolate, sometimes emarginate at the apex, subacute at the base, 5–10 cm. long, 2–4 cm. broad, glabrous ; branchlets and leaf-rhachis armed with sharp recurved prickles ; panicles nearly as long as the leaves ; flowers clustered and sessile ; fruits ellipsoid, about 6 mm. long ; seeds black and shining .. .. 1. *xanthoxyloides*

Leaflets conspicuously acuminate :
Leaflets pilose or pubescent on the midrib below :
Leaflets pubescent more or less all over the lower surface, oblong-lanceolate, 12–13 cm. long, 4–6 cm. broad, crenulate, very closely gland-dotted ; fruits ovoid, 1 cm. long, slightly pubescent .. .. 2. *pubescens*
Leaflets pilose mainly on the midrib and nerves, oblong-oblanceolate, abruptly acuminate, 5–10 cm. long, 2–3·5 cm. broad, with very few scattered glands ; pedicels 2–3 mm. long .. .. 3. *viridis*
Leaflets glabrous below :
Leaflets elongate-oblong, unequal-sided and more or less subcordate at the base, 15 cm. or more long, up to 10 cm. broad, glabrous, with numerous spreading lateral nerves ; branchlets and leaf-rhachis clothed with short sharp straight prickles 5–6 mm. long ; panicles very large ; flowers sessile on the branches ; fruits suborbicular, 5 mm. diam. ; seeds globose, black .. .. .. 4. *macrophylla*
Leaflets more or less shortly oblong, lanceolate or elliptic-ovate, much shorter than above, usually cuneate or rounded at the base :
Leaflets narrowly lanceolate, small, up to 4 cm. long and 1 cm. broad, crenulate, glabrous ; rhachis armed with very small straight prickles about 2 mm. long ; female flowers in terminal spicate racemes .. .. .. 5. *Leprieurii*

FIG. 167.—CLAUSENA ANISATA *Oliv.* (RUTACEAE).

A, inflorescence. B, flower-bud. C, open flower. D, same in vertical section. E, stamen from front. F, same, side view. G, pistil. H, cross section of ovary. I, fruits.

Leaflets oblong to broadly elliptic or ovate, much larger than above :
Lateral nerves about 10–12 pairs, spreading from the midrib at a wide angle and nearly straight towards the margin, with usually prominent secondary nerves more or less parallel to them :
Leaflets broadly oblong-elliptic, very long-caudate-acuminate, about 12 cm. long and 4 cm. broad, prominently punctate .. .. .. 6. *angolensis*
Leaflets oblong-lanceolate, rather shortly acuminate, 6–7 cm. long, about 2 cm. broad, not conspicuously punctate ; fruits globose, rugose, about 5 mm. diam. 7. *Unwinii*
Lateral nerves fewer than above and more or less arcuate, with reticulate venation between :
Leaflets subentire :
Leaflets broadly elliptic or ovate-elliptic, more or less rounded at the base, rather long-caudate-acuminate, about 10 cm. long and 5–6 cm. broad, thin ; panicles 15–20 cm. long ; pedicels 2·5 mm. long ; fruits broadly ellipsoid, 1 cm. long, nearly glabrous ; branches with stout straight prickles 1 cm. long 8. *melanacantha*
Leaflets obovate or oblong, cuneate at the base, long-acuminate, 6–8 cm. long, 2–3 cm. broad, thin ; panicles much-branched, large ; prickles 8 mm. long, slightly recurved .. .. 9. *rubescens*

Leaflets distinctly crenate, more or less oblong-elliptic, subcaudate, acuminate, shortly cuneate at the base, 8–12 cm. long, 2·5–6 cm. broad, sparingly gland-dotted ; panicles large, much branched ; fruits subglobose, 7 mm. long, glabrous ; branches and leaf-rhachis here and there sharply prickly .. 10. *attiensis*

1. **Fagara xanthoxyloides** *Lam.* Encycl. 2 : 446. *Xanthoxylum senegalense* DC.—F.T.A. 1 : 305 ; Holl. 1 : 121 ; Chev. Bot. 100. *X. polygamum* Schum. & Thonn. *Fagara senegalensis* A. Chev. Bot. 101. A glabrous shrub or tree sometimes up to 40 ft. high, with shining aromatic foliage and bark and cream-white flowers.
From Cape Verde to S. Nigeria, mostly in the coastal regions, and sometimes planted elsewhere. Exsicc.—*Perrottet. Brunner* 115. *T. Vogel* 77. *Barter* 1137. *Moloney. Rowland. Millen* 39. *Dawodu* 350. *Debeaux. Chev.* 3153. *Warnecke* 249 ; 389. (See Appendix).
2. **F. pubescens** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8 : 144 ; Bot. 100. A shrub 6–12 ft. high, with tomentose branchlets armed with straight spines ; fruit red when ripe.
French Guinea : Futa Jallon, Dalaba-Diaguissa Plateau, common (Sept.-Oct.) ! Exsicc.—*Chev.* 18348 ; 18882.
3. **F. viridis** *A. Chev.* l.c. 143 ; Bot. 101. A shrub 6–12 ft. high, branched from the base, with pubescent branchlets sparsely spiny ; flowers greenish-white in terminal panicles.
Ivory Coast : Upper Sassandra, between Goućkangouiné and Drouplen (May) ! S. Nigeria : Oban ! Exsicc.—*Chev.* 21445. *Talb.* 1274.
4. **F. macrophylla** *Engl.* in Engl. & Prantl, Pflanzenf. 3, 4 : 118 ; Chev. Bot. 100. *Xanthoxylum macrophyllum* Oliv.—F.T.A. 1 : 304. An evergreen tree 30–40 ft. high, the branches armed with often large spines.
Sierra Leone : Bandama (fr. Mar.) ! Ivory Coast : Ery, near Makougnié (Jan.) ! Gold Coast : Dunkwa ! S. Nigeria : Ibadan forest reserve (Sept., fr. Jan.) ! Uregin, Benin ! Extends to Angola. Exsicc.—*Punch* 127. *Unwin* 114. *Aylmer* 201. *Vigne* 888. (See Appendix).
5. **F. Leprieurii** *Engl.* l.c. 118. *Xanthoxylum Leprieurii* Guill. & Perr.—F.T.A. 1 : 306 ; Chev. Bot. 100. *X. parvifoliolum* A. Chev. Bot. 100. A tree up to 30 ft. high ; branchlets armed with short prickles.
Senegal. French Guinea : Timbo (Mar.) ! Bowali (Nov.) ! Ivory Coast : Indénié, Mbasso, on the Lower Comoé (Mar.) ! Exsicc.—*Leprieur. Chev.* 12574 ; 13602 ; 15055 ; 16263. (See Appendix).
6. **F. angolensis** *Engl.* Bot. Jahrb. 23 : 148. *F. Afzelii* Engl. *Xanthoxylum nitens* Hiern. *X. crenatum* A. Chev. Bot. 99, name only. A tree 70–80 ft., with a stem 2–3 ft. diam., covered with strong prickles.
Sierra Leone : York Pass (June) ! Ivory Coast : Middle Sassandra Valley (June) ! Also in Angola. Exsicc.—*Afzelius. Lane-Poole* 314. *Chev.* 19183.
7. **F. Unwinii** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined.
S. Nigeria : Boji Hills, 4,800 ft. (fr. June) ! Exsicc.—*Unwin* 13.
8. **F. melanacantha** *Engl.* in Engl. & Prantl, Pflanzenf. 3, 4 : 118. *Xanthoxylum melanacanthum* Planch.—F.T.A. 1 : 305 ; Chev. Bot. 100. A glabrous shrub or small tree up to 20 ft. high.
French Guinea : Le Labé (Feb.) ! Sierra Leone : Freetown (young fr. June) ! Leicester (June) ! S. Nigeria : Lagos ! Exsicc.—*T. Vogel* 181. *Dawodu* 196. *Chev.* 12267. (See Appendix).
9. **F. rubescens** *Engl.* l.c. 118. *Xanthoxylum rubescens* Planch.—F.T.A. 1 : 305. A glabrous shrub or small tree with brownish branchlets and panicles of creamy white flowers.
Sierra Leone : Falaba ! Gold Coast : Cape Coast (July) ! Accra Plain, at foot of Aburi Hills (Nov.) ! Exsicc.—*T. Vogel* 15. *Johnson* 233. *Sc. Elliot* 5214. *Afzelius.*
10. **F. attiensis** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Xanthoxylum attiense* A. Chev. Bot. 99, name only. A shrub or small tree with pubescent spiny branchlets, odorous leaves, and small pinkish-white flowers.
Sierra Leone : ? locality ! Ivory Coast : Alépé (Feb.-Mar.) ! Morénou, between Bangouanou and Endé. Gold Coast : Okroase (May) ! S. Nigeria : ? locality. Exsicc.—*Chev.* 17423 ; 22471. *Sc. Elliot* 5745. *Johnson* 750. *Thomas* 1797.

3. AFRAEGLE Engl. Pflanzenw. Afr. 3, 1 : 761.

Branchlets often armed with axillary spines about 2 cm. long ; leaves trifoliolate ; leaflets shortly stalked, obovate or oblanceolate, obtuse or emarginate at the apex, 4–6·5 cm. long, 2–3·5 cm. broad, glabrous, entire, finely pellucid-glandular ; flowers few in short axillary cymes ; pedicels constricted and jointed at the base ; calyx coriaceous, short and broadly lobed ; petals oblong, imbricate ; stamens 12–20, free ; fruit globose, about 9 cm. diam. .. .. *paniculata*

A. paniculata *Engl.* Veg. der Erde 3, 1 : 761, fig. 355. *Citrus paniculata* Schumacher. *Aegle Barteri* Hook. f. Ic. Pl. t. 2285 ; Holl. 1 : 136. *Limonia Warneckei* Engl. ; Chev. Bot. 101. *Balsamocitrus paniculata* Swingle ; Chev. Bot. 102. A shrub or medium-sized tree, with grey-green branchlets, white fragrant flowers, and hard-shelled orange-like fruit 2–4 in. diam.
Commonly planted in villages from Gold Coast to Nigeria. Exsicc.—*Barter* 3404. *Kitson* 635. *Rowland. Dalz.* 1268. *Foster* 168. *Lamb* 44. *Chev.* 23749 ; 23833 ; 23879 ; 24238. *Warnecke* 113. (See Appendix).
Besides the above, Engler (l.c.) mentions a species from Fernando Po, *A. Mildbraedii* Engl., which is as yet imperfectly known ; the leaflets are toothed.

4. TECLEA Del. in Ann. Sci. Nat. Ser. 2, 20 : 90 (1843) ; Verdoorn in Kew Bull. 1926 : 401.

Inflorescence paniculate or cymose :
Inflorescences axillary, short and rather few-flowered ; leaves trifoliolate ; leaflets elliptic-oblong or obovate-oblanceolate, gradually acuminate, cuneate at the base, 7–19 cm. long, 2·5–7 cm. broad, glabrous ; petiole 2–4·5 cm. long ; panicle minutely puberulous ; male flowers pedicellate ; petals and stamens 4 .. 1. *grandifolia*
Inflorescences terminal, with numerous small flowers ; leaves trifoliolate ; leaflets oblong or oblong-elliptic, abruptly acuminate, cuneate at the base, 10–16 cm. long, 3·5–5·5 cm. broad, with a few raised glandular dots on the upper surface ; petiole 3–4 cm. long ; panicle softly puberulous ; male flowers sessile in globose clusters ; petals and stamens 4 ; fruit about 1·2 cm. long, narrow, curved .. 2. *Zenkeri*
Inflorescence of short axillary racemes ; leaves trifoliolate ; leaflets oblanceolate, long-acuminate, cuneate at the base, up to 12 cm. long and 3 cm. broad, the lateral nerves numerous and close, glandular below ; fruit obovoid, 1·5 cm. long, oblique at the apex, 1-celled .. .. 3. *Afzelii*

1. **Teclea grandifolia** *Engl.* Bot. Jahrb. 23 : 153 ; Verdoorn l.c. 407. An unarmed shrub or tree with greenish glabrous branchlets.
Sierra Leone : Sugarloaf Mt. (May) ! S. Nigeria : Johann-Albrechtshöhe ! Also in French Cameroons and Uganda. Exsicc.—*Barter* (no number). *Staudt* 472 ; 493.
2. **T. Zenkeri** *Engl.* Bot. Jahrb. 32 : 120 ; Verdoorn l.c. 407. Like the last.
S. Nigeria : Johann-Albrechtshöhe ! Also in French Cameroons. Exsicc.—*Staudt* 590.
3. **T. Afzelii** *Engl.* Bot. Jahrb. 23 : 153 ; Verdoorn l.c. 405. Habit of the preceding.
Sierra Leone : ? locality ! Exsicc.—*Afzelius*.

5. ORICIA Pierre in Bull. Soc. Linn. Paris 2 : 1288 (1897) ; Verdoorn in Kew Bull. 1926 : 411.

Leaves trifoliolate ; leaflets obovate, the middle one the largest, all cuneate at the base and broadly pointed at the apex or emarginate, 6–14 cm. long, 2·5–8 cm. broad, with about 6 pairs of distinct lateral nerves ; midrib puberulous above ; flowers small in terminal panicles, glabrous ; peduncles pubescent ; petals and stamens 4 ; fruit of 2 free carpels with 1–2 rudimentary ones, pubescent at the base
1. *suaveolens*

Leaves, etc., as above, but leaflets elongate-oblong, 18–20 cm. long, and peduncle at most finely puberulous .. .. 2. *trifoliolata*

1. **O. suaveolens** *Verdoorn* in Kew Bull. 1926 : 413. *Teclea suaveolens* Engl. *Oricia leonensis* Engl. A shrub with pale greenish pubescent branchlets, odorous leaves and small whitish flowers.
French Guinea : Kindia (Mar.) ! Sierra Leone : Sugarloaf Mt. (Mar.) ! Exsicc.—*Afzelius*. *Dalz.* 977. *Chev.* 13100.
2. **O. trifoliolata** *Verdoorn* l.c. *Araliopsis trifoliolata* Engl. A tall tree with puberulous branchlets and large leaves.
S. Nigeria : Victoria, on bush-covered hills (Mar.) ! Exsicc.—*Zahn* 499.

6. AEGLOPSIS Swingle in Bull. Soc. Bot. Fr. 58, Mém. 8d : 237. pl. ii. and iii. (1911).

Branchlets with axillary spines ; leaves simple, subsessile, elliptic, shortly acuminate, shortly cuneate at the base, 5–12 cm. long, 2·5–7 cm. broad, densely glandular-punctate ; flowers in very short axillary panicles up to 5 cm. long ; buds ovoid ; calyx shortly lobed ; petals 4 or 5, oblong or lanceolate, about 1 cm. long ; stamens 8–10, free ; ovary 5–6-celled, style very short ; fruit spherical or pear-shaped, 6–9 cm. diam. .. .. *Chevalieri*

A. Chevalieri *Swingle* l.c. 240. *Balsamocitrus Chevalieri* Swingle ; Chev. Bot. 102. A small tree 8–12 ft. high, branched from the base ; branchlets glabrous, green when young ; flowers white.
Ivory Coast : Sassandra Port, near the sea (May) ! Tabou ! Exsicc.—*Chev.* 17940.

7. CITROPSIS Swingle & Kellermann in Journ. Agric. Research 1 : 421 (1914).

Branchlets with sharp axillary spines ; leaves trifoliolate or 5–7-foliolate, very broadly winged between the leaflets ; leaflets sessile, broadly elliptic to obovate, shortly acuminate, rounded or unequally cuneate at the base, up to 15 cm. long and 10 cm. broad, crenulate, laxly pellucid-dotted, glabrous ; wings up to 3 cm. broad ; flowers shortly pedicellate, in axillary clusters ; calyx small ; petals usually 4, narrowly oblong, 1·3–1·5 cm. long, glabrous ; fruits ovoid-globose .. .. *articulata*

C. articulata *Swingle & Kellermann* l.c. 433 ; Engl. Pflanzenw. Afr. 3, 1 : 758, fig. 354, F-H. *Citrus articulata* Willd. *ex* Spreng. *Limonia Preussii* Engl. ; *L. mirabilis* A. Chev. *Citropsis Preussii* Swingle & Kellermann ; *C. mirabilis* Swingle & Kellermann. (According to Engler, l.c. p. 760, *Limonia Demeusii* De Wild. and *L. Poggei* Engl. are synonyms.) A shrub or tree, branched from the base, with green branchlets and white very fragrant flowers.
Ivory Coast : Touradougou, Upper Sassandra, at edge of forest by the Koué stream (May). Gold Coast : Akwapim Hills. Togo : Misahöhe, Koli R., near Kame ! S. Nigeria : Oban ! Barombi (Sept.) ! Johann-Albrechtshöhe. Also in French Cameroons and south to Angola. Exsicc.—*Talb.* 577 ; 1273 ; 1472. *Preuss* 548. *Staudt* 747. *Baumann* 552. *Chev.* 21609. (See Appendix).

103. SIMARUBACEAE

Trees or shrubs, sometimes with a bitter bark, rarely spiny. Leaves alternate or rarely opposite, pinnate, rarely simple and very rarely gland-dotted ; stipules absent or rarely present and often very long. Flowers small, unisexual or polygamous, rarely hermaphrodite, actinomorphic. Calyx-lobes 3-5. Petals 3 5, imbricate or valvate, rarely absent, free or united into a tube. Disk present. Stamens inserted at the base of the disk, equal or double the number of the petals, rarely numerous, free, sometimes with a scale at the base ; anthers 2-celled, opening lengthwise. Ovary usually 2-5-lobed, 1-5-celled, or carpels quite separate ; styles 1-5 ; ovules usually solitary, rarely 2 or more, axile. Fruit usually indehiscent, sometimes samaroid. Seeds with or without endosperm ; embryo straight or curved.

Mainly tropical regions ; usually with very bitter bark and eglandular leaves, either pinnate, 2-foliolate or simple ; stipules when present usually long and enveloping the terminal bud.

Leaves simple :
Branchlets not spiny : stipules enclosing the young buds, deciduous and leaving a circular scar :
Ovary 5–6-celled ; fruit depressed, 4–6-angled ; stipules very long 1. **Klainedoxa**
Ovary 2-celled ; fruit more or less ellipsoid ; stipules rather small .. 2. **Irvingia**
Branchlets spiny ; leaves mostly borne on short arrested branches ; flowers in short cymes .. .. 3. **Nitraria**
Leaves compound :
Leaves 2-foliolate ; flowers few in supra-axillary fascicles or umbels ; branchlets usually armed with supra-axillary spines .. .. 4. **Balanites**
Leaves pinnate :
Flowers hermaphrodite :
Stamens thrice as many as the petals ; filaments villous at the base .. 5. **Mannia**
Stamens twice as many as the petals :
Petals imbricate ; style long .. .. 6. **Quassia**
Petals subvalvate ; style short .. .. 7. **Harrisonia**
Flowers unisexual :
Stamens twice as many as the petals ; calyx closed in bud, rupturing into unequal segments ; fruits not reticulate .. .. 8. **Hannoa**
Stamens the same number as the petals ; calyx open in bud ; flowers very small and numerous ; fruits reticulate .. .. 9. **Brucea**

1. KLAINEDOXA Pierre *ex* Engl. in Engl. & Prantl, Pflanzenf. 3, 4 : 227 (1896).

Leaves shortly cuneate or rounded at the base, ovate or broadly elliptic, shortly acuminate (or on young shoots oblong-lanceolate), 7–14 cm. long, 4–7 cm. broad, leathery, closely and finely reticulate on both surfaces, glabrous, with numerous rather faint lateral nerves ; stipules very long, enclosing the buds, linear, acute, up to 10 cm. long, glabrous, deciduous ; racemes paniculate, up to about 12 cm. long, glabrous ; pedicels 3 mm. long ; sepals broadly obovate, 1·5 mm. long ; petals about twice as large ; fruits depressed-globose, 4–6-angled, hard, 4–5 cm. diam. .. 1. *gabonensis*
Leaves broadly rounded and shortly cordate at the base, very broadly elliptic or ovate-elliptic, obtusely pointed, 15–20 cm. long, 7–10 cm. broad, laxly reticulate, glabrous, with numerous rather prominent lateral nerves ; stipules about 2 cm. long ; racemes as above but pedicels shorter .. .. 2. *grandifolia*

1. **K. gabonensis** *Pierre* ex *Engl.* l.c. *K. gabonensis* var. *oblongifolia* Engl. *K. oblongifolia* Stapf. A tree 60–80 or more feet high, buttressed at the base ; flowers small in reddish inflorescences covering the tree.
Sierra Leone : Lokko country (Apr.) ! Ivory Coast : Yapo (Oct.) ! Mbago (Feb.) ; Indenie (Mar.). Gold Coast : Kumasi ! Obuasi (fr. Jan.) ! S. Nigeria : Oni ! Ondo forests ! Victoria (Jan.) ! Extends south to Congo and through Shari-Ubangi to Uganda. Exsicc.—*Sc. Elliot* 5717. *Chipp* 710. *Soyaux* 648. *Sankey* 18. *Kalbreyer* 10.

2. **K. grandifolia** *Engl.* Bot. Jahrb. 39 : 575. *K. Buesgenii* Engl. *Irvingia grandifolia* Engl. *Irvingiella grandifolia* H. Hallier. A tall tree 80 ft. or more high.
S. Nigeria : Lofun Ologbon (Nov.) ! Also in French Cameroons and Gabon. Exsicc.—*Sankey*.

2. IRVINGIA Hook. f.—F.T.A. 1 : 313.

Leaves broadly rounded or subcordate at the base, broadly ovate, gradually and broadly acuminate, 6–10 cm. long, 5–7 cm. broad, firmly papery, glabrous, with numerous spreading lateral nerves, finely reticulate on both surfaces ; petiole nearly 1 cm. long ; stipules 2–2·5 cm. long, deciduous ; racemes paniculate, about as long as the leaves, glabrous ; pedicels 3–5 mm. long ; sepals ovate-elliptic, thin, 1 mm. long ; petals rounded-elliptic, about 4 mm. long ; fruits oblong-ellipsoid, 4–5 cm. long 1. *Smithii*
Leaves elliptic or obovate-elliptic, shortly and broadly acuminate, more or less cuneate or narrowly rounded at the base, 6–12 cm. long, 4–6·5 cm. broad, thinly papery, with about 6 pairs of lateral nerves, often glossy above, reticulate ; petiole up to 1 cm. long ; stipules up to 1·5 cm. long, very acute, deciduous and leaving a scar ; racemes very short and clustered, few-flowered, flowers sometimes subumbellate ; pedicels up to 1 cm. long, slender ; sepals and petals as above ; fruits broadly ellipsoid, about 5–6 cm. diam., with a fibrous bristly exocarp and smooth skin and hard endocarp 2. *gabunensis*

1. **I. Smithii** *Hook. f.*—F.T.A. 1 : 314 ; Holl. 1 : 138. A glabrous tree 80–40 ft. high, with small yellowish fragrant flowers and scarlet somewhat plum-like fruit ; on river banks and in fringing forests.
N. Nigeria : Nupe ! Bida (Jan.–Feb.) ! Gurara R. (fr. July) ! Kontagora (Jan., fr. Nov.) ! S. Nigeria : Lower Niger, Abo, etc. ! Extends to E. Sudan and N. Angola. Exsicc.—*T. Vogel* 10. *Barter* 1319. *Elliott* 174. *Daltz.* 98. *Yates* 43.

2. **I. gabonensis** *Baill.* ex *Lanen* Pl. Util. Colon. Franç. 1886 : 812. *I. Barteri* Hook. f.—F.T.A. 1 : 314, incl. var. *tenuifolia* Oliv. ; Holl. 1 : 137 ; Chev. Bot. 104. *I. tenuifolia* Hook. f. *Mangifera gabonensis* Aubry-Lecomte *ex* O'Rorke in Journ. Pharm. et Chim. Ser. 3, 31 : 275. *I. tenuinucleata* Van Tiegh. A large forest tree, with grey stem, shining foliage and yellow mango-like fruit ; the branchlets ending in a narrow curved stipular sheath which covers the leaf-bud is a recognisable feature.
Senegal : Casamance, Fogny (fr. Feb.) ! French Guinea : between Kouria and Ymbo, on the Konkouré R. (Nov.) ! Sierra Leone : ? locality (fr. Jan.) ! Ivory Coast : Sanvi (Mar.) ; Sassandra, between Davo

and Soubré (May); Yapo (Oct.)! Dahomey: Adjara, near Porto Novo (Jan.)! N. Nigeria: Agale (Sept., Nov.)! S. Nigeria: Lagos! Apapa (Dec., Jan.)! Ebute Metta (Nov.)! Lagos Colony! Abeokuta! Benin district (Sept.)! Ishere (Nov.)! Asaba! Cross River (Feb.)! Cameroons R. (Jan.)! Extends to Ubangi, Gabon and Princes Isl. Exsicc.—*Irving* 74; 75. *Mann* 2206. *Rowland.* *Moloney* 11. *Millen* 8; 24. *Dawodu* 22. *Leslie* 33. *Unwin & Smythe* 66. *Farquhar* 7; 71. *Yates* 26. *Chev.* 3157.

3. NITRARIA Linn.—F.T.A. 1 : 288.

A shrub 8–10 ft. high; branchlets becoming spiny; leaves mostly borne on short arrested branchlets, obovate, entire, 1·5–3 cm. long, up to 1 cm. broad, rather fleshy, glabrous; petiole slender, about 4 mm. long; flowers in short cymes, nearly sessile, the terminal ones pedicellate; sepals ovate-lanceolate, fleshy, slightly puberulous, about 1·5 mm. long; petals about twice as long; fruits narrowly conical, triangular, 1 cm. long, capped by the sessile stigma .. .. *senegalensis*

N. senegalensis *Lam.*—F.T.A. 1 : 288 (as *N. Schoberi* Linn.). *N. tridentata* Chev. Bot. 97, not of Desf. A plant of dry and saline areas. A variety of "Nitre Bush," sometimes eaten by camels.
Mauritania: Port Etienne (Feb., Mar.)! Senegal: on the banks of the Lower Senegal R. (Jan.)!

4. BALANITES Del.—F.T.A. 1 : 314.

Branches armed with rigid simple supra-axillary spines up to 8 cm. long; leaflets subsessile, obovate- to orbicular-rhomboid, up to 5 cm. long and 4·5 cm. broad, subflabellately nerved from the base, nerves prominent on both sides; petiole about 1 cm. long, softly tomentellous; flowers few in supra-axillary fascicles or rarely subracemose; pedicels nearly 1 cm. long, tomentellous; buds ovoid, obtuse, 4 mm. long, tomentellous; sepals deciduous; petals oblong, 5 mm. long, glabrous inside; disk small; ovary tomentose; fruit broadly oblong-ellipsoid, rounded at each end, 3–4 cm. long, smooth or wrinkled, tomentellous when young

1. *aegyptiaca*

Branches armed with small often forked spines 1–2 cm. long; leaflets petiolulate, broadly ovate or ovate-orbicular, acuminate, 5–9 cm. long, 5–6 cm. broad, glabrous, pinnately nerved; petiole 2 cm. long, minutely puberulous; flowers in supra-axillary umbels; peduncle 5 mm. long; pedicels 1 cm. long, puberulous; buds nearly globose, obtuse; petals 8 mm. long, long-pilose inside; disk large; ovary tomentose; fruits ovoid-ellipsoid, obtusely pointed, 5·5 cm. long, 4 cm. diam.

2. *Wilsoniana*

1. B. aegyptiaca *Del.*—F.T.A. 1 : 315. *B. zizyphoides* Mildbr. & Schlechter. *Agialida senegalensis*, *A. Barteri* and *A. tombouctensis* Van Tiegh. A tree 20–30 ft. high, with greenish stems and branches and yellow stone-fruit.
Common in the drier regions from Mauritania to Palestine and Arabia; also in Uganda and Tanganyika. Exsicc.—*Barter* 739. *Yates* 21. *Shaw* 105. *Foster* 24. *Talb.* 555. *Kersting* A. 533. *Chev.* 1197. (See Appendix).

2. B. Wilsoniana *Dawe & Sprague* in Journ. Linn. Soc. Bot. 37 : 506. *B. Tieghemi* A. Chev. Bot. 105. A large tree 40–90 or more feet high, with high buttresses at the base, green-grey bark and smooth striate branchlets.
Ivory Coast: Morénou, between Endé and Yaboisso (Dec.)! Indénié, between Diambarakrou and Borobo; Sassandra Basin, between Soubré and Guidéko; Middle Comoé, near Zaranou. Gold Coast: Adeambra, W. Ashanti (Apr.)! Dahomey: in the wooded region in the south of the Hollis country. Also in French Cameroons, Uganda and Kenya. Exsicc.—*Vigne* 859. *Chev.* 22482.

5. MANNIA Hook. f.—F.T.A. 1 : 312.

Leaflets oblong-elliptic, rounded and unequal-sided at the base, very abruptly and shortly acuminate, acumen thick, 10–18 cm. long, up to 9 cm. broad, leathery, with numerous much-branched lateral nerves and slightly impressed veins; petiolules about 3 mm. long; racemes clustered or paniculate, up to 40 cm. long; pedicels nearly 1 cm. long; calyx-lobes orbicular, 2·5 mm. long; petals elliptic, 1 cm. long; stamens villous at the base; fruits oblong-ellipsoid, 7 cm. long, 4–5 cm. broad, apiculate, woody .. .. *africana*

M. africana *Hook. f.*—F.T.A. 1 : 312. *Trichoscypha mannioides* A. Chev. Bot. 161. *Simarubopsis Kerstingii* Engl. Pflanzenw. Afr. 3, 1 : 777, fig. 365. *Pierreodendron grandifolium* Engl. A tree up to 60–90 ft. high, with long bole without branches; leaves 2–3 ft. long, with numerous leaflets.
Ivory Coast: Dabou (Feb.)! Assinie (Apr.)! Gold Coast: Aburi (cult. ?)! Togo: Sokode-Basari, Kulumi (fr. Dec.)! S. Nigeria: Nun R. (Sept.)! Calabar (Feb.)! Also in French Cameroons, Gabon and Lower Congo. Exsicc.—*Mann* 480; 2266. *Chev.* 16212. *Kersting* 708.

6. QUASSIA Linn.—F.T.A. 1 : 312.

Leaflets opposite, 3–4 pairs, obliquely elliptic, caudate-acuminate, unequal-sided at the base, 10–15 cm. long, 4–6 cm. broad, thin, glabrous, with about 9 pairs of obscure lateral nerves; rhachis narrowly winged, often constricted at the joints; panicles very narrow, shorter than the leaves; pedicels 5 mm. long; petals linear-oblong, 1·5 cm. long; stamens shortly pilose towards the base; fruits slightly flattened, obovate-elliptic, with sharp edges, about 2·5 cm. long, very laxly reticulate

africana

Q. africana *Baill.*—F.T.A. 1 : 312. A glabrous shrub 8–12 ft. high.
S. Nigeria: Cameroons R. (Jan.)! Extends to Gabon and Congo. Exsicc.—*Mann* 2191.

7. HARRISONIA R. Brown—F.T.A. 1 : 311.

Leaflets usually opposite, 4–8 pairs, oblanceolate to elliptic, rounded or slightly acuminate, narrow at the base, about 4 cm. long and 1·5 cm. broad, entire or crenate, slightly pubescent below; rhachis narrowly winged; panicles terminal, many-flowered; flowers globose in bud, tomentose, small; fruits depressed-globose, 7–8-lobulate, hollowed on the top, about 6 mm. diam. .. .. .. *occidentalis*

H. occidentalis *Engl.* in Notizbl. Bot. Gart. Berlin 1 : 57. *Xanthoxylum guineense* Stapf 584. A shrub 10–15 ft. high, the leaves often with paired prickles at the base, with branches sometimes long and sarmentose, and erect panicles of small white flowers.

Fairly common from French Guinea to French Cameroons! Extends to Uganda and Angola. Exsicc.—*Ansell. Barter* 3338. *Sc. Elliot* 4887; 5310. *Rowland. Millen* 106. *Johnson* 711; 896. *Staudt* 963.

8. HANNOA Planch.—F.T.A. 1 : 309.

Leaflets about 3 pairs, on very long (2–3 cm.) petiolules, oblong or oblong-obovate, rounded to a broad mucro at the apex, cuneate at the base, 4–8 cm. long, 2–4 cm. broad, rigidly chartaceous, glabrous and obscurely veined; panicles terminal, lax, longer than the leaves, the flowers more or less glomerate, finely puberulous; calyx closed in bud, at length opening by two or three broad segments; petals broadly obovate, 4 mm. long; fruits oblong, nearly 2 cm. long; glabrous .. 1. *undulata*

FIG. 168.—HANNOA KLAINEANA *Pierre*. (SIMARUBACEAE).

A, flower-bud. B, open flower. C, stamen. D, flower with petals and stamens removed. E, fruits. F, fruit in vertical section. G, fruit in cross section.

Leaflets about 3–7 pairs, on short (about 5 mm.) petiolules, oblong or elliptic, similar to above but nerves distinct and impressed below; flowers and fruits more or less as above, the latter up to 3 cm. long .. .. 2. *Klaineana*

1. **H. undulata** *Planch.*—F.T.A. 1 : 309; Holl. 1 : 136; Lely 67; Chev. Bot. 103; Engl. Pflanzenw. Afr. 3, 1 : 774, fig. 363. A glabrous tree, up to 30 ft. or more high, with pale foliage, grey corky bark deeply fissured; flowers white, fragrant; fruit black, plum-like.

A common tree of savannah woodlands from Senegal to N. Nigeria and Central Cameroons. Exsicc.—*Heudelot* 435. *Barter* 1023. *Poboguin* 594; 854. *Kersting* A. 322.

2. **H. Klaineana** *Pierre & Engl.* in Engl. Bot. Jahrb. 46 : 282. A large tree, 60–80 ft. high, glabrous except on the inflorescence, with tall straight bole without buttresses and shining foliage.

In forest and river fringes from French Guinea to Gabon and Angola. Exsicc.—*Mann* 458. *Dawodu* 91. *Unwin* 3. *Lane-Poole* 393. *Aylmer* 238. *Chipp* 356. *Mildbraed* 7375.

9. BRUCEA Mill.—F.T.A. 1 : 309.

Leaflets opposite, 4–6 pairs, ovate-oblong, acuminate, rounded or slightly cuneate at the base, 18 cm. long, 10 cm. broad, thin, undulate on the margin, puberulous on the midrib below; lateral nerves about 7 pairs; rhachis constricted at the joints; panicles very narrow, many-flowered, up to 40 cm. long, tomentellous; flowers very small, unisexual; fruits ellipsoid, 1 cm. long, reticulate .. .. 1. *macrophylla*

Leaflets narrowly ovate, acute or shortly acuminate, rounded at the base, 10 cm. long, 4 cm. broad, rusty-pubescent below; lateral nerves about 9 pairs; panicles elongated, the flowers clustered and subsessile on the tomentose axis; fruits as above 2. *antidysenterica*

1. **Brucea macrophylla** *Oliv.*—F.T.A. 1 : 310. A small tree 10–15 ft. high, with leaves up to 3 ft. long and rusty-pubescent panicles of tiny red flowers.
Sierra Leone : Ambas Bay (Feb.) ! Also in French Cameroons and Corisco Island. Exsicc.—*Mann* 774.
2. **B. antidysenterica** *Mill.*—F.T.A. 1 : 309. *B. salutaris* A. Chev. Bot. 104. A small little-branched tree, up to 15 or 20 ft. high, yellow rusty-tomentose, with leaves 1 ft. or more long.
French Guinea : various localities ! Cameroons Mt., 7,000–8,000 ft. (Jan., Dec.) ! Also in Abyssinia and E. Africa. Exsicc.—*Mann* 1188 ; 2174. *Chev.* 12703 ; 18596 ; 18760.

104. BURSERACEAE

Trees or shrubs, secreting resin or oil. Leaves alternate, rarely opposite, pinnate, rarely 1-foliolate ; stipules absent. Flowers hermaphrodite or rarely unisexual, small. Sepals 3–5, imbricate or valvate. Petals 3–5, rarely absent, free or variously connate, imbricate or valvate. Disk present. Stamens the same or double the number of the petals ; filaments free ; anthers 2-celled, opening by slits. Ovary superior, 2–8-celled ; ovules 2 or 1 in each cell, axile.

Fig. 169.—Boswellia Dalzielii *Hutch.* (Burseraceae).
A, flower. B, petal. C, stamen. D, pistil in vertical section showing disk. E, cross section of ovary.

Fruit a drupe or rarely a capsule. Seeds without endosperm ; cotyledons often contortuplicate.

Confined to the tropics and recognised by the frequently fragrant resinous wood, pinnate leaves, usually drupaceous fruit, and seeds without endosperm.

Fruit a capsule ; leaflets serrate ; flowers in fasciculate racemes or panicles at the ends of the shoot .. .. 1. **Boswellia**
Fruit a drupe :
Fruits fairly large and smooth ; leaflets entire :
Calyx divided to the base or nearly so ; indumentum of stellate hairs or absent 2. **Pachylobus**
Calyx divided up to a little below the middle ; indumentum of simple hairs 3. **Canarium**
Fruits small, reticulate ; flowers axillary ; leaflets usually toothed 4. **Commiphora**

1. BOSWELLIA Roxb.—F.T.A. 1 : 323 ; Engl. in DC. Monogr. Burserac. 30.

Inflorescence a simple raceme ; racemes numerous and bunched at the end of the thick shoots, up to 25 cm. long, glabrous or nearly so ; pedicels spreading, about 1 cm. long ; sepals triangular-ovate, 1·25 mm. long ; petals about 7 mm. long ; leaflets about 8 pairs, opposite, obliquely lanceolate, acutely acuminate, 7–9 cm. long, 1·5–2 cm. broad, coarsely serrate .. .. 1. *Dalzielii*

Inflorescence a panicle; panicles few, up to 30 cm. long, softly pubescent; pedicels about 0·5 cm. long; sepals broadly triangular; petals as above; leaflets subalternate, linear-lanceolate, long-acuminate, about 8 cm. long and 1·5 cm. broad, serrate .. .. 2. *odorata*

1. **B. Dalzielii** *Hutch.* in Kew Bull. 1910 : 136; Lely 26; Chev. Bot. 110. A small or medium-sized tree, with pale papery bark; flowers white, fragrant, the petals sometimes red-veined, flowering before the leaves.
French Sudan: Gourma, from Diapaga to Fada, from Nayabondi to Penconga (July); Mossi, from Ouagnan to the White Volta (Aug.)! N. Nigeria: Kontagora (Feb.)! Sokoto Prov., Anka to Damri (May)! Tureta! Abundant locally in the province. Zaria Province, Auchang, etc. (Feb.)! Maska (Feb.)! Bauchi Plateau, Vom, 3,000–4,500 ft.! Also in N. Cameroons. Exsicc.—*Dalz.* 279; 340. *Lely* 698; 811. *Foster* 8. *Shaw* 105. *Dent-Young* 26. (See Appendix).
2. **B. odorata** *Hutch.* l.c. 137. Like the last.
N. Nigeria: Yola town and province (Feb.)! Exsicc.—*Dalz.* 167.

2. PACHYLOBUS Don Gen. Syst. 2 : 89.

Indumentum of inflorescence stellate:
Leaflets 6–8 pairs, the lateral oblong to oblong-elliptic, caudate-acuminate, obliquely rounded at the base, 10–18 cm. long, 4–6·5 cm. broad, minutely stellate-puberulous on the nerves below, the nerves numerous and very prominent below; inflorescence paniculate, covered with rusty short stellate hairs; rhachis deeply grooved; calyx divided nearly to the base; ovary glabrous; fruit oblong-ellipsoid, 7 cm. long, 3·5 cm. diam., blue when ripe .. .. 1. *edulis*
Leaflets about 3 pairs:
Leaflets very shortly and abruptly acuminate:
Leaflets opposite, broadly oblong-elliptic, unequal-sided and shortly cuneate at the base, shortly acuminate, 15–20 cm. long, 6–12 cm. broad, glabrous below, with about 9 pairs of lateral nerves; rhachis flat on the upper side towards the base; panicles branched from the base, much shorter than the leaves, seen only in a young state; sepals thick .. .. 2. *macrophyllus*
Leaflets narrowly oblong-elliptic, very oblique at the base, abruptly acuminate, 5–12 cm. long, 2–6 cm. broad, glabrous below, glossy, with about 8 pairs of lateral nerves; panicles terminal, branched from the base, longer than the leaves; sepals and petals stellate-scaly .. .. 3. *Barteri*
Leaflets long-caudate-acuminate, oblong, very unequal-sided and cuneate at the base, 8–14 cm. long, 3·5–5 cm. broad, subopposite, glabrous and strongly reticulate on both sides, with about 10 pairs of lateral nerves; young fruits shortly pedicellate, lepidote .. .. 4. *Afzelii*
Indumentum absent; leaflets 3–4 pairs, oblong-elliptic, caudate-acuminate, 7–10 cm. long, 3–4·5 cm. broad, with about 6 pairs of lateral nerves; panicles small and few-flowered; pedicels nearly 1 cm. long; sepals broadly and shortly ovate 5. *balsamifera*

1. **Pachylobus edulis** *Don* Gen. Syst. 2 : 89; Holl. 1 : 141. *Canarium edule* Hook. f.—F.T.A. 1 : 327; Engl. in DC. Monogr. Burserac. 144. *Canarium Saphu* Engl. *P. Saphu* Engl. A tree with dark foliage and smooth bark, exuding resin, 30–60 or more feet high, often planted.
S. Nigeria: Benin! Uwet (Feb.)! Calabar! Barombi. Cameroons Mt.: Victoria! Cameroons R. (Jan.)! Extends to Congo and Angola. Exsicc.—*Mann* 741. *Thomson* 46. *Unwin* 41. *Preuss* 362. (See Appendix).
2. **P. macrophyllus** Engl. in Engl. & Prantl, Pflanzenfam. 3, 4 : 243. *Canarium macrophyllum* Oliv.—F.T.A. 1 : 327; Engl. in DC. Monogr. Burserac. 143. A tree 30 ft. or more high, with pale rusty-puberulous branchlets.
S. Nigeria: Oban! Also in Elobe Island, off Gabon. Exsicc.—*Talb.* 1715.
3. **P. Barteri** *Engl.* Bot. Jahrb. 26 : 366. *P. dahomensis* Engl. A shrub or small tree with rusty-puberulous branchlets.
Togo: Misahöhe! Dahomey: Kotonu (fr. July). N. Nigeria: Lokoja, on cliffs of Patti (Oct.)! S. Nigeria: Onitsha! Exsicc.—*Barter* 1775. *Dalz.* 189. *Mildbraed* 7322. *Chev.* 4441.
4. **P. Afzelii** *Engl.* Bot. Jahrb. 26 : 366. A tree with rusty-pilose branchlets.
Sierra Leone! Exsicc.—*Afzelius.* (See Appendix).
5. **P. balsamifera** *Guillaum.* in Bull. Soc. Bot. Franç. 55 : 265. *Santiriopsis balsamifera* Engl. A small tree 20–30 ft. high, with brownish-grey glabrous branchlets and fruit somewhat chestnut-like, about 1½ in. diam.
S. Nigeria: Oban. Also in Gabon and St. Thomas Island. Exsicc.—*Talb.* 1713.

Imperfectly known species.

P. albiflorus *Guillaum.* in Journ. de Bot. 22 : 18, name only.
Ivory Coast: Dabou. Also in Gabon. Exsicc.—*Jolly* 161.

3. CANARIUM Linn.—F.T.A. 1 : 327; Engl. in DC. Monogr. Burserac. 101.

Leaflets 8–15 pairs, opposite or subopposite, oblong or oblong-lanceolate, cordate at the base, apex rather abruptly acuminate, 8–18 cm. long, 3–6 cm. broad, pubescent on the numerous very prominent lateral nerves below; rhachis flat on the upper side towards the base; panicles in the upper leaf-axils, much shorter than the leaves, shortly pubescent; calyx 3-lobed to below the middle, about 8 mm. long, tomentellous; petals 3, a little longer than the calyx, tomentellous with glabrous margins; fruits 3–3·5 cm. long, narrowly oblong-ellipsoid, glabrous .. 1. *Schweinfurthii*
Leaflets 4–6 pairs, opposite, usually anisophyllous, the lowest pair near the base and stipuliform, orbicular, about 1·5 cm. broad, the others elliptic or ovate-elliptic,

abruptly acutely acuminate, rounded at the base, 9–12 cm. long, 4–6·5 cm. broad, with about 12 pairs of lateral nerves, puberulous on the nerves; panicles oblong, much longer than the leaves, with dichotomously branched side branchlets, softly tomentellous; flowers sessile .. .. 2. *auriculatum*

1. **Canarium Schweinfurthii** Engl. in DC. Monogr. Burserac. 145; Holl. 1: 142; Chev. Bot. 111. *C. occidentale* A. Chev. A large forest tree with unbuttressed bole reaching to 90 ft., longitudinally fissured bark, and rusty-pubescent branchlets; it yields a fragrant resin.
Sierra Leone: Central Province (July-Aug.)! Ivory Coast: Alépé, in the Indénlé, Attlé and Sanvi! Azaguié (fr. Sept.)! Environs of Bingerville; Baoulé Nord, at Bouaké. Gold Coast: Kwaben! Togo: Misahöhe (fr. Nov.)! N. Nigeria: Bida (Déc.-Jan.)! Kutigi, Niger Province! S. Nigeria: forests of Western, Central and particularly the Eastern Provinces! Johann-Albrechtshöhe! Extends to E. Sudan, E. Africa and south to Angola. Exsicc.—*Thompson* 17. *Foster* 204. *King-Church* 42. *Unwin* 19. *Lane-Poole* 190. *Yates* 21. *Lamb* 43. *Chev.* 16236; 22288. *Staudt* 507. *Mildbraed* 7278. (See Appendix).
2. **C. auriculatum** *H. Winkl.* in Engl. Bot. Jahrb. 41: 279. A tree 25–30 ft. high with striate puberulous or glabrous branchlets and whitish-yellow flowers.
S. Nigeria: Victoria (Mar.)! Exsicc.—*Winkler* 1157.

Imperfectly known species.

C. Chevalieri *Guillaum.* in Bull. Soc. Bot. Fr. Mém. 8: 33.
Ivory Coast: Bingerville, Abidjean, Dabou. Exsicc.—*Chev.* 15272; 15385 (not seen in Paris).
C. Khiala *A. Chev.* Bot. 110, name only.
Ivory Coast: Cavally Basin, Tabou, sea-coast (Aug.). Exsicc.—*Chev.* 20066.

4. COMMIPHORA Jacq.—F.T.A. 1: 324 (as *Balsamodendron* Kunth); Engl. in DC. Monogr. Burserac. 7.

Leaves pinnate:
Leaflets about 5 pairs, very acutely acuminate, oblong-ovate, unequal-sided at the base, 6–12 cm. long, 2·5–4·5 cm. broad, thin, obscurely crenulate, glabrous; petiolule 1 cm. long; panicles as long as or longer than the leaves, the flowers crowded at the ends of the lateral branchlets, thinly pubescent; male flowers turbinate, pedicellate, about 5 mm. long; fruits subglobose, about 1·2–2 cm. diam., verrucose when dry .. .. 1. *Kerstingii*
Leaflets 3–4 pairs, rounded at the apex, oblong, 2–5 cm. long, 1–2 cm. broad, softly pubescent on both sides, subsessile; flowers few on an axillary peduncle up to 5 cm. long; calyx villous; fruits ellipsoid, about 1 cm. long, shortly pubescent 2. *pedunculata*

Leaves trifoliolate:
Leaflets softly pubescent below, coarsely crenate-dentate, obovate, cuneate at the base, the terminal one the largest, up to 4 cm. long and 2·5 cm. broad; petiole shorter than the leaflets; branchlets often terminated by a spine; flowers axillary, subsessile, glabrous; fruits broadly ellipsoid, 7–8 mm. long, glabrous, with a purplish bloom .. .. 3. *africana*
Leaflets glabrous below, obscurely crenate, obovate-rhomboid, 2·5–4 cm. long, 1·5–3 cm. broad, very thin; petiole longer than the leaflets; branchlets often spiny; flowers not seen; fruits fleshy, ellipsoid-globose, 1 cm. long .. .. 4. *Dalzielii*

1. **C. Kerstingii** *Engl.* Bot. Jahrb. 44: 152. *C. araroba* Engl. A tree 20–30 ft. high, with smooth green bark eventually peeling in brownish papery strips[1]; panicles crowded at the end of the branchlets, which are brown-tomentellous and marked by leaf-scars; often planted.
Togo: Ssoruba village (Apr.)! Atakpamé (Mar.). N. Nigeria: Yola (May)! Zungeru (fr. July)! Sokoto Province, etc., fairly commonly planted in villages. Also in N. Cameroons. Exsicc.—*Kersting* A. 553. *Dalz.* 165; 572. (See Appendix).
2. **C. pedunculata** *Engl.* in DC. Monogr. Burserac. 23; Chev. Bot. 110. *Balsamodendron pedunculatum* Kotschy & Peyr.—F.T.A. 1: 326. A small tree with leaves usually crowded at the end of the yellowish pubescent branchlets; flowers whitish, the lateral branchlets occasionally hardening into spines.
French Sudan: Quiébélé (June)! Yatenga North! Macina. Dahomey: Mts. Atacora, Kouandé (June). N. Nigeria: Nupe! Katagum (fr. Sept.)! Yola (May)! Extends to E. Sudan and Nile Land. Exsicc.—*Barter* 1678. *Dalz.* 174; 224. (See Appendix).
3. **C. africana** *Engl.* l.c. 14; Holl. 1: 140; Chev. Bot. 109 (incl. var. *ramosissima* Engl.). *Balsamodendron africanum* Arn.—F.T.A. 1: 325; Lely 20. *Heudelotia africana* Rich. in Guill. & Perr. Tent. Fl. Senceg. 1: 150, t. 39. A shrub or sometimes a small tree up to 15 or 20 ft. high, usually with spines; leaves and bark fragrant resinous, bark of the branchlets red-purple in colour; flowering usually when leafless.
French Sudan: Goundam (Oct.)! Gourma and Mossi, Koupéla (fr. July). Senegal: Richard Tol! Togo: Lome, by lagoons! Yendi. Dahomey: Dassa-Zoumé (planted); Gourma, Diapaga to Fada. N. Nigeria: Jebba! Katagum (May)! Makawa (Oct.)! Kuka (fr. Mar., Dec.)! Extends to E. Sudan and Abyssinia. Exsicc.—*Heudelot* 125. *E. Vogel* 102. *Barter* (no number). *Dalz.* 223. *Warnecke* 341. (See Appendix).
4. **C. Dalzielii** *Hutch.* in Kew Bull. 1928, ined. A glabrous shrub about 10 ft. high.
Gold Coast: Winnebah Plain, amongst clumps of shrubs (fr. Feb.)! Exsicc.—*Dalz.* 8296.

105. MELIACEAE

Trees or shrubs, mostly with hard scented wood, very rarely subherbaceous. Leaves alternate, mostly pinnate; stipules absent. Flowers actinomorphic, mostly hermaphrodite. Calyx often small, imbricate, rarely valvate. Petals free or partially connate, contorted or imbricate, or adnate to the staminal tube and valvate. Stamens mostly 8 or 10, rarely numerous, mostly with connate filaments, and the anthers often sessile in the tube; anthers 2-celled, opening

lengthwise ; disk various. Ovary superior, often 3–5-celled, stigma often disciform or capitate ; ovules mostly 2, rarely 1 or more. Fruit baccate, capsular or rarely a drupe, often with a large central axis. Seeds with or without endosperm, sometimes winged.

Mainly a tropical family readily recognised by the pinnate eglandular leaves and the stamens, usually connate into a tube resembling a corolla.

Leaves simply pinnate or trifoliolate :
Petals free to the base :
Fruit capsular :
Fruits more or less globose, not lobed, large and woody ; seeds flat, winged all round ; leaflets opposite or subopposite ; flowers paniculate ; stigma broadly capitate .. .. 1. **Khaya**
Fruits ellipsoid or small and lobed ; seeds thick, not winged :
Fruits large, 5-ridged ; flowers in lax elongated panicles ; anthers exserted from the staminal tube .. .. 2. **Carapa**
Fruits short and drupe-like ; flowers in pyramidal or elongated slender panicles ; anthers included in the staminal tube .. .. 3. **Guarea**
Fruits small, depressed, 5-lobed ; flowers in lax cymes ; anthers exserted from the tube .. .. 4. **Trichilia**
Fruits oblong or elongated ; seeds with a long terminal wing ; flowers in wide cymose panicles :
Capsule with membranous valves .. .. 5. **Lovoa**
Capsule with woody valves :
Leaflets undulately toothed .. .. 6. **Pseudocedrela**
Leaflets entire .. .. 7. **Entandrophragma**
Fruit drupaceous ; flowers in slender panicles ; leaflets entire .. .. 8. **Ekebergia**
Petals united into a club-shaped tube, hairy outside ; leaves pinnate or trifoliolate 9. **Turraeanthus**
Leaves simple (unifoliolate) ; petals spathulate or linear ; flowers subsolitary or subumbellate ; style exserted from the slender staminal column ; fruit a fleshy capsule 10. **Turraea**
Leaves bipinnate ; leaflets toothed ; fruits drupaceous ; petals more or less spathulate, becoming reflexed ; flowers in cymose panicles .. .. 11. **Melia**

1. KHAYA A. Juss.—F.T.A. 1 : 337.

Leaflets broadly elliptic or ovate-elliptic, about twice as long as broad ; flowers 4–5-merous :
Flowers 5-merous ; fruits 5-valved, 7–8 cm. diam. ; leaflets shortly and abruptly acuminate, shortly cuneate or somewhat rounded at the base, 15–20 cm. long, 6–9 cm. broad, rather thin and papery, with about 12 pairs of lateral nerves ; petals 5 mm. long .. .. 1. *grandifoliola*
Flowers 4-merous (rarely 5-merous) ; fruits 4-valved, 6–7 cm. diam. ; leaflets rounded or subtruncate at the apex, rarely slightly acuminate, very shortly cuneate at the base, 8–15 cm. long, 4–7 cm. broad, rigidly subcoriaceous, with about 6–9 pairs of lateral nerves ; petals 4–5 mm. long .. .. 2. *anthotheca*
Leaflets more or less oblong or narrowly oblong-elliptic, 3–5 times as long as broad :
Leaflets distinctly acuminate (acumen 0·5–1·5 cm. long) ; fruits 5-valved (rarely 4-valved) :
Acumen of leaflets about 0·5 cm. long, the lateral nerves usually faint ; fruits 5–6 cm. diam. ; leaflets oblong or narrowly oblong-elliptic, caudate-acuminate, rounded and somewhat unequal-sided at the base, averaging about 8–9 cm. long and about 3·5 cm. broad, firmly papery or rather rigid, with about 6–7 pairs of arcuate spreading lateral nerves ; petals 5 mm. long .. .. 3. *ivorensis*
Acumen of leaflets about 1·5 cm. long, the lateral nerves very conspicuous below and prominently looped ; fruits about 7 cm. diam., 5-valved, valves about 8 cm. long and 4·5 cm. broad ; leaflets elongate-oblong or oblong-oblanceolate, about 15 cm. long and 3·5–4·5 cm. broad, thin, with undulate margins .. .. 4. *caudata*
Leaflets not acuminate or only slightly so, 3–4 times as long as broad, oblong or oblong-elliptic, when dry (like the branchlets) usually pale greenish-grey or glaucous ; flowers 4-merous ; fruits globose, 4-valved, 5–6 cm. diam. ; seeds broadly oblong-elliptic, about 4 cm. broad, including the narrow wing all round 5. *senegalensis*

1. **K. grandifoliola** *C.DC.* in Bull. Soc. Bot. Fr. 54, Mém. 8 : 10. *K. Punchii* Stapfand *K. grandis* Stapf ; Holl 1 : 152. *K. kissiensis* A. Chev. A glabrous tree, with bole up to about 70 ft., usually buttressed at the base, and girth up to 14 ft. ; leaves more or less shining.
In mixed forests from French Guinea to French Cameroons and Upper Ubangi and E. Sudan. Exsicc.—*Punch* 104. *Thompson* 7 ; 74. *Unwin* 17 ; 18. *Foster* 89. *Farquhar* 46. *Chev.* 20687 ; 23774. (See Appendix).

2. **Khaya anthotheca** *C.DC.* in DC. Monogr. 1 : 721. *K. agboensis* A. Chev. Bot. 116, name only. *K. euryphylla* Harms. A tall glabrous tree, 100–120 ft. high; fruits sometimes 5-valved.
Ivory Coast: Aghoville (fr. Nov.). Gold Coast: Ashanti, Nyinahin. Kibbi (Mar.). N. Nigeria: Lokoja. S. Nigeria: Johann-Albrechtshöhe (Mar.). Also in French Cameroons, Angola and Uganda. Exsicc.—*Thompson* 47. *Barter* 580. *Brent* 542. *Staudt* 677. (See Appendix).
3. **K. ivorensis** *A. Cher.* in Vég. Util. Afr. Trop. Franç. 5 : 207. *K. Klainei* Pierre *ex* A. Chev. A glabrous tree of the forests, with bole up to 80–90 ft., strongly buttressed, and leaves crowded at the end of the branchlets; panicles lax, comparatively few-flowered.
In forests from Ivory Coast to French Cameroons and to Gabon. Exsicc.—*Chipp* 12; 37; 207; 213; 302; 383. *Vigne* 892. (See Appendix).
4. **K. caudata** *Stapf* MSS. *K. Klainei* Pierre ? Chev. Bot. 117. *K. ivorensis* var., Chev. Bot. 117. Possibly only a young condition of the preceding species.
Ivory Coast: Attié, between Potou Lagoon and Alépé; Anyama (Feb.). S. Nigeria: Abo Forest; Calabar. Exsicc.—*Unwin* 45. *Chev.* 14151; 14171; 14175; 17397; 20101.
5. **K. senegalensis** *A. Juss.*—F.T.A. 1 : 338; Guill. & Perr. Tent. Fl. Seneg. 1 : 130, t. 32; Holl. 1 : 153; Lely 72; Chev. Bot. 117, incl. var. *spectabilis* A. Chev. *K. Kerstingii* Engl. A glabrous tree with pale green foliage and grey scaly bark, 50–60 ft. or sometimes up to 80 ft. high, trunk up to 10 ft. girth, not buttressed; flowers whitish with a red disk around the ovary, in lax panicles in the axils of the leaves at the ends of the branchlets.
In the more open woods by streams, etc., from French Sudan to French Cameroons, and extending to E. Sudan and Uganda. Exsicc.—*Ozanne* 9; 10. *Elliott* 24; 165. *Farmar* 107. *Thompson* 60. *McLeod* 827. *Pobéguin* 685; 2004. (See Appendix).

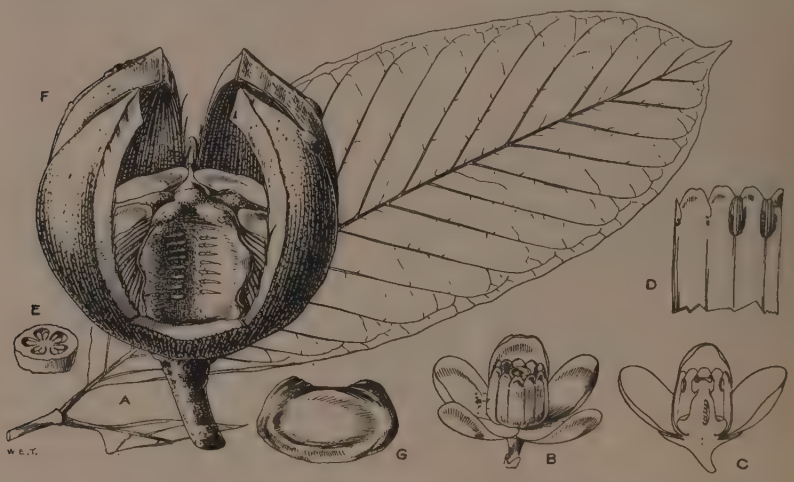

FIG. 170.—KHAYA GRANDIFOLIOLA *C.DC.* (MELIACEAE).

A, leaflet. B, flower. C, same in vertical section. D, staminal tube from inside. E, cross section of ovary. F, fruit with portion of wall removed. G, winged seed.

2. CARAPA Aubl.—F.T.A. 1 : 336.

Leaflets about 6 on each side, opposite to alternate, very variable in size and shape, elliptic to elongate-oblong, mostly shortly acuminate, up to 40 cm. long and 10 cm. broad, papery, entire, glabrous, usually drying brown, finely reticulate below; flowers in long slender panicles, glabrous or occasionally puberulous; pedicels up to 5 mm. long; bracts minutely ciliate; sepals ovate, ciliate; petals about 5 mm. long; staminal column glabrous, widely tubular; fruits ellipsoid, beaked, corrugated outside, many-seeded, about 15 cm. long, ribbed; seeds obliquely ovoid, with flattened surfaces, about 4·5 cm. long, reticulate on the surface .. .. .. *procera*

C. procera *DC.* Prodr. 1 : 626; Holl. 1 : 149; Chev. Bot. 115. *C. guyanensis* Oliv.—F.T.A. 1 : 336, not of Aubl.; Holl. 1 : 148. *C. guineensis* G. Don. *C. Touloucouna* Guill. & Perr. *C. velutina* C.DC.; Chev. Bot. 116. *C. Gogo* A. Chev. *C. microcarpa* A. Chev. *C. gummiflua* C.DC. A tree 20–30 ft. high in fringing forests, often much larger in monsoon forests; leaves shining, often 3 ft. or more long, usually crowded at the ends of the branches, wine-red when young; flowers cream-white with reddish centre, fragrant.
Throughout the area and south to Angola. Also in West Indies and Guiana.
This differs from *C. guyanensis* Aubl., a native of tropical America, by its pedicellate flowers with ciliate bracts and calyx-lobes. The form named by C. de Candolle as *C. velutina* is apparently only a slightly puberulous condition which is met with here and there throughout the area. (See Appendix).

3. GUAREA Linn. Mant. 2 : 150 (1771) (*Heckeldora* Pierre).

Inflorescences long and slender, with few flowers on short lateral branchlets; leafy branchlets slender:
Petals hairy all over the outer surface, about 7 mm. long; leaflets about 5 pairs, elongate-oblong, long-acuminate, about 15 cm. long and 3–5 cm. broad, with

FIG. 171.—CARAPA PROCERA *DC.* (MELIACEAE).

A, leaflet. B, flower. C, same in vertical section. D, portion of staminal tube. E, cross section of ovary. F, fruit with valve removed. G, seed.

numerous very obscure lateral nerves, glabrous; rhachis of leaves nearly glabrous; fruits deeply lobed, 2 cm. long, tomentellous .. .. .. 1. *glomerulata*

Petals hairy only on the margin, about 8 mm. long; leaflets about 3 pairs, elliptic, long-acuminate, 7–10 cm. long, about 3·5 cm. broad, with about 5 pairs of obscure lateral nerves; rhachis of leaves slightly puberulous .. .. .. 2. *leonensis*

Petals glabrous, about 8 mm. long; leaflets 3–4 pairs, oblong-elliptic to elongate-obovate, acuminate, glabrous, about 15 cm. long and up to 7 cm. broad, with 9–12 pairs of very slender looped lateral nerves; rhachis of leaves more or less puberulous .. 3. *nigerica*

Inflorescences rather short and stout, more or less pyramidal; petals shortly pubescent only down the middle, about 1 cm. long; leaflets 3–4 pairs, elongate-elliptic, shortly pointed, up to about 18 cm. long and 7 cm. broad, glabrous, with about 12 pairs of distinct lateral nerves; leafy branchlets stout .. .. .. -4. *Thompsonii*

1. **Guarea glomerulata** *Harms* in Engl. Bot. Jahrb. 23 : 159. *G. glomerulata* var. *obanensis* Bak. f. A shrub about 10–20 ft. high, with drooping branches, greenish-yellow flowers, and red-brown hairy 3–5-lobed fruits.
   S. Nigeria: Oban! Fernando Po (*fide* Engl. Veg. der Erde ix. 818). Also in French Cameroons. Exsicc.—*Talb.* 412; 417; 1285.
2. **G. leonensis** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A shrub or small tree.
   Sierra Leone: Gola Forest (Jan.)! Kotelmahun! Exsicc.—*Unwin & Smythe* 39. *Lane-Poole* 337.
3. **G. nigerica** *Bak. f.* in Cat. Talb. Nig. Pl. 18. *G. parviflora* Bak. f. *G. Staudtii* Harms? A shrub up to about 20 ft. high; flowers white turning brown, in long narrow drooping panicles.
   S. Nigeria: Oban! Victoria (Jan.)! Johann-Albrechtshöhe. Cameroons Mt. Also in French Cameroons and Fernando Po. Exsicc.—*Talb.* 593; 1281; 1350. *Kalbreyer* 4.
4. **G. Thompsonii** *Sprague & Hutch.* in Kew Bull. 1906 : 245; Holl. 1 : 146. A forest tree attaining 12 ft. in girth, slightly buttressed, with glabrous branchlets, rather shining foliage and yellow flowers.
   Gold Coast: West Prov. Jamang (Apr.)! S. Nigeria: Benin! Exsicc.—*Thompson* 16. *Vigne* 955. (See Appendix).

4. TRICHILIA Linn.—F.T.A. 1 : 333.

Leaflets rounded and emarginate or almost bilobed at the apex:

Leaflets 7–12, rounded at the apex and base, subsessile; flowers 1·5 cm. long, tomentellous; blade of leaflets oblong or oblong-elliptic, the end one more or less obovate, 5–15 cm. long, 3–8 cm. broad, shortly and rather thinly pubescent below; lateral nerves numerous, spreading .. .. 1. *emetica*

Leaflets 3–5, widely bilobed-emarginate, narrowed to the base; flowers about 1 cm. long, tomentellous; blade of leaflets oblanceolate, 6–12 cm. long, 2·5–5 cm. broad, glabrous below; lateral nerves numerous but faint; fruits broadly obovoid, about 3 cm. long, valves mucronate, finely tomentellous .. .. .. 2. *retusa*

Leaflets more or less pointed or acuminate:

Leaflets glabrous or slightly hairy, mainly on the nerves below:

Flowers on opening 1·5–2 cm. long, thick:

Leaflets 2–3 pairs, slightly pointed at the apex, broadly oblong-elliptic, 10–18 cm. long, 5–8 cm. broad, with about 10–15 pairs of lateral nerves but very inconspicuous venation; rhachis loosely pilose; corolla 1·5 cm. long 3. *splendida*

Leaflets about 6 pairs, acutely acuminate, oblong-lanceolate, 9–14 cm. long, 3–3·5 cm. broad, with 10–12 pairs of lateral nerves but very obscure venation; rhachis minutely puberulous; corolla 2 cm. long .. .. .. 4. *megalantha*

Flowers on opening 1 cm. long or less:

Inflorescence from ½ up to nearly as long as the leaf, 15 cm. long or more:

Flower-buds very small (under 5 mm.) and subglobose; bracts deciduous, very small; leaflets 6–8 pairs, subalternate, oblong-elliptic, acutely acuminate, shortly cuneate at the base, 10–16 cm. long, 4–7 cm. broad, shortly pilose on the 10–12 pairs of lateral nerves below .. .. 5. *rubescens*

Flower-buds larger (about 8 mm.) and oblong; bracts persistent, 5–8 mm. long; petals narrow; leaflets oblong, acutely acuminate, up to 23 cm. long and 7 cm. broad, glabrous or nearly so below on the 12 or so pairs of lateral nerves 6. *Zenkeri*

Inflorescence very short, up to about ¼ as long as the leaves; bracts deciduous or minute:

Filaments free towards the top; leaflets oblanceolate to obovate, mostly long-attenuated to the base, acutely acuminate, 8–15 cm. long, 2·5–6 cm. broad, shortly pubescent on the numerous pairs of lateral nerves below; petals about 8 mm. long, narrow; fruits obovoid-globose, finely tomentellous.. 7. *Heudelotii*

Filaments united to the top; leaflets more or less broadly elliptic, mostly very shortly cuneate at the base:

Leaflets 2 pairs, oblong-elliptic, long-acuminate, the terminal one up to 18 cm. long and 6 cm. broad, glabrous; lateral nerves 12–14 pairs; inflorescence about 2 cm. long .. .. 8. *senegalensis*

Leaflets 3–5 pairs:

Leaflets more or less obovate or oblanceolate, cuneate at the base, 2–3 times as long as broad, bright green, glabrous, with about 6–8 pairs of lateral nerves; young fruits subglobose, glabrous .. .. 9. *Prieuriana*

Leaflets elongate-oblong, more or less rounded or unequal-sided at the base, 4–5 times as long as broad, with numerous lateral nerves and a fine venation between; fruits subglobose, about 3 cm. long, glabrous .. 10. *cedrata*

Leaflets villous-tomentose below, acutely acuminate, rounded at the base, 7–14 cm. long, 3–4·5 cm. broad, with about 25 pairs of nerves impressed above, prominent and pilose below; fruits (young) obovoid, fig-like, rugose and thinly pilose 11. *Mildbraedii*

1. **Trichilia emetica** *Vahl*—F.T.A. 1 : 335; Holl. 1 : 146; Lely 112; Chev. Bot. 113. A tree 20–30 ft. high, densely yellowish-pubescent on the young parts, with white flowers and crimson 3 or 4-valved capsular fruits.
   Throughout the area in deciduous forests and savannah woodlands, extending to Abyssinia and Arabia, Uganda, East Africa south to Rhodesia. Exsicc.—*Heudelot. Barter* 740; 1222. *Rowland* 3. *Dalz.* 89. (See Appendix).
2. **T. retusa** *Oliv.*—F.T.A. 1 : 334. A glabrous tree of fringing forests, 40 ft. high, with fragrant white flowers and usually 2-valved fruit.
   S. Nigeria: Idah! N. Nigeria: Nupe! Abinsi (Jan.)! Extends through Ubangi-Shari to E. Sudan and Congo. Exsicc.—*T. Vogel* 50. *Barter* 1181. *Dalz.* 865.
3. **T. splendida** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8 : 147; Bot. 115. A small tree 15–45 ft. high, laxly brown-pubescent on the young parts and on the inflorescence; flowers fairly large, white, very fragrant.
   French Guinea: Kissidougou (Feb.)! Exsicc.—*Chev.* 20708.
4. **T. megalantha** *Harms* in Engl. Bot. Jahrb. 23 : 160. A tree, shortly brown-pubescent on branchlets and inflorescence.
   S. Nigeria: Lagos Colony! Exsicc.—*Rowland.*
5. **T. rubescens** *Oliv.*—F.T.A. 1 : 336. A shrub or small tree 12–15 ft. high, nearly glabrous, the leaves 1–2 ft. long, drying light brown.
   S. Nigeria: Ambas Bay! Fernando Po (Jan.)! Extends to Gabon. Exsicc.—*Mann* 163, partly.
6. **T. Zenkeri** *Harms* l.c. 161. A tree, glabrous or slightly pubescent, the inflorescence brownish, shortly pubescent, with yellow or yellowish-green very fragrant flowers.
   S. Nigeria: Oban! Also in Cameroons. Exsicc.—*Talb.* 1370; 1712.
7. **T. Heudelotii** *Planch.*—F.T.A. 1 : 334; Holl. 1 : 148; Chev. Bot. 114. *T. acutifoliola* A. Chev. *T. Candollei* A. Chev. A tree 25–45 ft. high with straight stem, flowers whitish- or greenish-yellow fragrant.
   Common in mixed deciduous forests from Senegal to French Cameroons and Fernando Po, extending to Gabon. Exsicc.—*Heudelot* 842. *Morson. Mann* 163, partly. *Sc. Elliot* 4396; 4542; 4986; 5496; 5605. *Brown* 932. *Millen* 136. *Unwin* 35. *Foster* 180. *Talb.* 1370. *Chev.* 16262; 19641; 23405, etc. *Staudt* 592. (See Appendix).
8. **T. senegalensis** *C.DC.* in Bull. Soc. Bot. Franç. Mém. 8d : 10; Chev. Bot. 114.
   Senegal: Casamance (Jan.). Bignona (Feb.). Exsicc.—*Chev.* 3159; 3161; 3162; 3165 (not seen).
9. **T. Prieuriana** *A. Juss.*—F.T.A. 1 : 334; Guill. & Perr. Tent. Fl. Seneg. 1 : 125, t. 30; Holl. 1 : 148; Chev. Bot. 114. *T. lanata* A. Chev. *T. Djalonis* A. Chev. A glabrous tree, 30–40 or more feet high, with scaly flaking bark and fluted stem narrowly buttressed; flowers whitish, very fragrant.
   Common in mixed deciduous and comparatively dry forests from Cape Verde to French Cameroons, Gabon and Lower Congo. Exsicc.—*Heudelot* 775. *Barter* 1676; 2146. *Moloney. Sc. Elliot* 4620; 5436; 5922. *Rowland. Millen* 102. *Johnson* 540. *Punch* 101. *Dunlap* 181. *Chev.* 21480. *Debeaux* 178. *Kalbreyer* 205. *Warnecke* 416. *Kersting* A. 720. (See Appendix).
10. **T. cedrata** *A. Chev.* Vég. Util. Afr. Trop. Franç. 5 : 214; Bot. 113.
    Ivory Coast: various localities! Exsicc.—*Chev.* 16125, etc. (See Appendix).
11. **T. Mildbraedii** *Harms* in Notizbl. Berl. Bot. Gart. 7 : 232.
    Ivory Coast: Morénou (young fr. Feb.)! Also in French Cameroons. Exsicc.—*Chev.* 22469.

Imperfectly known species.

T. velutina *A. Chev.* Bot. 115, name only, not of C.DC.
Ivory Coast: between the Middle Sassandra and the Middle Cavally (July). Exsicc.—*Chev.* 19290 (not found in Herb. Chev.).
T. tomentosa *A. Chev.* Bot. 115, name only, not of H. B. & K.
French Guinea: Diaguissa (Apr.). Exsicc.—*Chev.* 12916.

5. LOVOA Harms in Engl. & Prantl, Pflanzenf. 3, 4 : 307 (1896).

Leaflets about 6 pairs, subopposite, elliptic, very slightly acuminate and emarginate, rounded or shortly pointed at the base, up to 20 cm. long and 9 cm. broad, glabrous, with numerous rather faint spreading lateral nerves; rhachis slightly winged; flowers numerous and small in large lax glabrous subcorymbose panicles; pedicels about 1·5 mm. long; sepals broad and truncate, wrinkled; petals elliptic, about 4 mm. long; fruits narrowly oblong, quadrangular, 5–6 cm. long; valves very thin, deciduous; seeds with a long terminal wing about 3 cm. long and 8 mm. broad .. *Klaineana*

L. Klaineana *Pierre* ex *Sprague* in Journ. Linn. Soc. 37 : 509. A forest tree up to 120 ft. high with bole of 60 ft. and 12 ft. girth, comparatively shortly buttressed, and flowers white; the narrow 4-sided fruits, with 8 seeds and thin valves separating above and below, are characteristic.
Sierra Leone: ? locality (Dec.)! Gold Coast: Ancobra R. (fr. Jan.)! Tsifufu (young fr. Mar.)! Tano R. (Dec.)! S. Nigeria: Uregin, Benin! Extends south to Gabon. Exsicc.—*Thompson* 9; 33. *Unwin & Smythe* 35. *Unwin* 110. *Chipp* 39. (See Appendix).

6. PSEUDOCEDRELA Harms in Engl. Bot. Jahrb. 22 : 153 (1895).

Leaves pinnate; leaflets alternate or rarely subopposite, 6–8 on each side, ovate-oblong or ovate-lanceolate, obtuse at the apex, rounded and unequal-sided at the base, undulately toothed or subentire, up to 15 cm. long and 6 cm. broad, softly pubescent mainly on the nerves below; lateral nerves about 10–12 pairs, spreading; rhachis softly tomentose; panicles thyrsoid, up to about 30 cm. long; branches rather long; pedicels about 4 mm. long, puberulous; calyx about 1 mm. long, 5-lobed; petals contorted, 2·5–3 mm. long, thinly pubescent up the middle; staminal column broadly campanulate, about 2·5 mm. long; anthers 10; fruits 5-celled, oblanceolate in outline, 10–12 cm. long, 3 cm. thick, opening by 5 nearly flat recurving woody valves

and leaving the sharply 5-angled axis ; seeds with a long terminal membranous wing about 6 cm. long with a stronger nerve on one side .. .. .. *Kotschyi*

Pseudocedrela Kotschyi *Harms* l.c. 154 ; Holl. 1 : 155 ; Chev. Bot. 119. *Cedrela Kotschyi* Schweinf. Reliq. Kotschyanae 36, t. 35. *P. Chevalieri* C.DC. A tree mostly of savannah forests, with grey fissured bark, panicles of fragrant white flowers and foliage grey-silvery when young, the leaflets somewhat resembling the leaves of the oak, commonly 20–30 ft. high, sometimes much larger, with bole of 25 ft. and 6 ft. girth.

From French Sudan to Nigeria, and extending through French Cameroons and Ubangi-Shari to E. Sudan, Abyssinia and Uganda. Exsicc.—*Barter* 1635 ; 1712. *Dalz.* 169 ; 218. *Dudgeon* iii. 105. *Foster* 17. (See Appendix).

7. ENTANDROPHRAGMA C.DC. in Bull. Herb. Boiss. 2 : 582, t. 21 (1894) ; Sprague in Kew Bull. 1910 : 177 and 1913 : 64.

Leaflets abruptly acuminate :

Midrib softly pubescent below ; extremities of shoots glabrous :

Leaflets 10–15 cm. or more long, more or less rounded at the base, broadly oblong-elliptic, shortly acuminate, with about 8–10 pairs of lateral nerves looped and

FIG. 172.—ENTANDROPHRAGMA UTILE *Sprague* (MELIACEAE).

A, leaflet. B, flower. C, same in vertical section. D, part of staminal tube. E, cross section of ovary. F, fruit with valve removed. G, seed.

fading towards the margin ; panicles crowded at the top of the shoots ; flowers 5–6 mm. long ; petals glabrous outside ; capsule erect, dehiscing from the base upwards, the valves deciduous in the form of a cap .. .. 1. *macrophyllum*

Leaflets under 10 cm. long, shortly cuneate at the base, narrowly oblong, very glossy above, abruptly mucronate, with about 10 pairs of spreading lateral nerves ; young panicles small, slightly puberulous ; fruit erect, dehiscing from the base upwards 2. *septentrionale*

Midrib glabrous below ; extremities of shoots tomentellous .. 3. *tomentosum*

Leaflets more or less gradually acuminate or rounded at the apex ; midrib glabrous below or only very slightly puberulous :

Leaflets obliquely subcordate at the base, oblong, about 15 cm. long, shortly acuminate ; lateral nerves 12 or more pairs ; leaf-rhachis and inflorescence tomentellous ; axils of lateral nerves of leaflets markedly hairy .. .. .. 4. *utile*

Leaflets cuneate or at most rounded at the base ; axils of lateral nerves glabrous or nearly so :

Inflorescence and leaf-rhachis puberulous :

Lateral nerves of leaflets 12 or more pairs ; leaflets rounded and slightly unequal at the base, about 9 cm. long, rounded at the apex .. .. 5. *Candollei*

Lateral nerves of leaflets 6–8 pairs ; leaflets obliquely oblong and shortly acuminate, 4–5–9 cm. long, up to 4 cm. broad, closely reticulate, especially above 6. *cylindricum*

Inflorescence and leaf-rhachis glabrous or nearly so; leaflets oblong to obovate-oblong, obtuse or shortly acuminate, 8–15 cm. long, 3·5–6·5 cm. broad

7. *Rederi*

1. **Entandrophragma macrophyllum** *A. Chev.* Vég. Util. Afr. Trop. Franç. 5 : 196; Bot. 118. A huge forest tree, 100–120 ft. or more high, with grey bark becoming scaly, and buttresses reaching 6–10 ft. from the base; trunk up to 8 ft. diameter above the buttresses; flowers small greenish-white in ample panicles.
French Guinea: Kissi, Massakoundou, Dougoula (Feb.). Ivory Coast: Bouroukrou (Dec., Jan.)! Azaguié! Middle Comoé, Assikasso (Dec.)! Agniéby Valley, Capiécrou! between Attéou and Guébo (Feb.)! Gold Coast: north of Chama! Also in French Cameroons. Exsicc.—*Chipp* 194. *Chev.* 22299, etc. (See Appendix).
2. **E. septentrionale** *A. Chev.* l.c. 205; Bot. 118. A large forest tree reaching over 100 ft. in height with bole of 60 ft., buttressed at the base, up to 6 ft. diameter above the buttresses; bark grey often with white blotches, fissured and sometimes flaking, exuding a resin.
Ivory Coast: fairly common throughout! Gold Coast: Tsifufu Forest! Fiapere! Axim! Exsicc.—*Thompson* 36. *Chipp* 90; 388. (See Appendix).
3. **E. tomentosum** *A. Chev.* Bot. 119. A tree 70–90 ft. high.
Ivory Coast: Bouroukrou (Jan.)! Exsicc.—*Chev.* 16132; 16140. (See Appendix).
4. **E. utile** *Sprague* in Kew Bull. 1910 : 180. *Pseudocedrela utilis* Dawe & Sprague. *E. macrocarpum* A. Chev.? A large forest tree up to 90 ft. high; bole with narrow buttresses reaching to nearly 20 ft., sometimes of enormous girth; branchlets and inflorescence light brownish-pubescent.
Gold Coast: Nyinahin! Western Ashanti forests; Fiapere, Sunyani! Also in French Cameroons and Uganda. Exsicc.—*Thompson* 48. *Chipp* 88. (See Appendix).
5. **E. Candollei** *Harms* in Notizbl. Bot. Gart. Berlin 1 : 181; Holl. 1 : 151. *E. ferrugineum* A. Chev. l.c. 195; Bot. 118. A large forest tree up to 150 ft. high, with a bole of 80–90 ft. and buttresses reaching to 10–12 ft.; young branchlets rusty-pubescent, leafy only at the ends.
French Guinea: Guerzé country, between Moussadougou and Lola. Ivory Coast: Mbasso, on the Lower Comoé! Gold Coast: Kunso, W. Ashanti (fr. Febr.)! S. Nigeria: Johann-Albrechtshöhe. Also in French Cameroons. Exsicc.—*Chipp* 206. *Chev.* 16261; 20968. *Staudt* 459. (See Appendix).
6. **E. cylindricum** *Sprague* l.c. 180. *Pseudocedrela cylindrica* Sprague. *E. rufa* A. Chev. Bot. 118. A large tree, with straight cylindrical bole up to 100 ft. without branches and comparatively weakly buttressed; branchlets strongly angular, leafy at the ends and minutely puberulous.
Ivory Coast: Agbo, in the Agniéby Valley! Guideko, Soubré, in the Middle Sassandra Basin! Gold Coast: Mansu! Tsifufu Forest! Ahiraso, W. Ashanti! Popokyere, E. of Tarkwa! Tikwabo, S.W. Colony! Togo: Misahöhe! Also in French Cameroons and Uganda. Exsicc.—*Thompson* 16; 34. *Chipp* 122; 200; 307. *Mildbr.* 7376. *Chev.* 16166; 16390; 19082. (See Appendix).
7. **E. Rederi** *Harms* in Notizbl. Bot. Gart. Berlin 5 : 184.
Cameroons Mt.: Buea (Feb.)! Exsicc.—*Reder* 1965. (See Appendix).

8. EKEBERGIA Sparrm.—F.T.A. 1 : 332.

Leaves pinnate; leaflets oblong or elliptic, shortly acuminate, unequal-sided and shortly cuneate at the base, 5–10 cm. long, 2·5–4·5 cm. broad, glaucescent and finely reticulate below; rhachis flat on the upper surface towards the base; panicles axillary, up to ⅔ as long as the leaves, puberulous; pedicels up to 2 mm. long; flower-buds ellipsoid; calyx saucer-shaped, dentate, about 1·5 mm. long, puberulous; petals about 5 mm. long, pubescent; stamens 10, monadelphous; fruits drupaceous, 5-celled, 5-lobed, globose in outline, 1·5–2 cm. long, glabrous .. .. .. *senegalensis*

E. senegalensis *A. Juss.*—F.T.A. 1 : 333; Guill. & Perr. Tent. Fl. Seneg. 1 : 126, t. 31; Lely 49; Chev. Bot. 112. *E. dahomensis* A. Chev. *Charia indeniensis* A. Chev. *Charia Chevalieri* C.DC. *Sorindeia Doeringii* Engl. & Krause. A tree about 30 ft. high, with smooth grey bark becoming rough and scaly and rather pale foliage crowded at the ends of the branchlets; fruit brownish, containing 2–4 bright red seeds with yellow aril.
Senegal! French Guinea: Moriquéniéba! Ivory Coast: Bettié, on the Lower Comoé (Mar.)! Gold Coast: near Wenchi, W. Ashanti (Mar.)! Togo: ? locality! Dahomey: Abomey (Feb.)! Savalou, Cabolé (fr. May)! N. Nigeria: Zaria (Mar.)! Sokoto (Mar.)! North to 11°.30 north lat. Extends to Upper Shari. Exsicc.—*Heudelot* 107; 378. *Dalz.* 17. *Lely* 850. *Chev.* 16255; 23133. *Kersting* I. 99. (See Appendix).

9. TURRAEANTHUS Baill. Adansonia 11 : 261 (1874).

Leaves pinnate:

Leaflets rounded at the apex, not acuminate, alternate, about 9 pairs, oblong, 10–15 cm. long, 3–5·5 cm. broad, glabrous, with about 18–20 pairs of slender spreading lateral nerves; petiolules nearly 1 cm. long, puberulous; panicles axillary, about 10 cm. long, rather few-flowered, rusty-puberulous; pedicels 5 mm. long; calyx cupular, 1·75 mm. long, denticulate; corolla 1 cm. long, tomentellous

1. *africana*

Leaflets shortly apiculate-acuminate, about 10–15 pairs, elongate-oblong, 15–25 cm. long, 4–6 cm. broad, glabrous, with 15–20 pairs of lateral nerves; petiolules very short; panicles narrow, about 15 cm. long, rusty-tomentellous all over; pedicels stout, 3 mm. long; calyx cupular, 3 mm. long, slightly dentate; corolla stout, 1·5 cm. long .. .. 2. *Zenkeri*

Leaflets rather long-acuminate, elongate-oblong-elliptic, rounded or shortly cuneate at the base, 15–25 cm. long, 5–8 cm. broad, thin, glabrous below; lateral nerves about 19–20 pairs; petiolules 1–1·5 cm. long, glabrous; panicles short; pedicels thick, rusty-puberulous; calyx and corolla as in *T. africana*, but corolla 1·5 cm. long

3. *Vignei*

Leaves trifoliolate or rarely 1-foliolate; leaflets very broadly elliptic, obtusely caudate-acuminate, very shortly cuneate at the base, 10–18 cm. long, 8–12 cm. broad, thin, glabrous; lateral nerves 3–4 on each side, prominent and looped below; flowers in very small short axillary cymes; calyx about 1 mm. long, toothed; corolla cylindric, 1 cm. long, puberulous .. .. 4. *Mannii*

1. **Turraeanthus africana** *Pellegrin* in Lecomte Not. Syst. 2 : 16, 68 ; Chev. Bot. 111. *Guarea africana* Welw. *Bingeria africana* A. Chev. A tree 60–80 ft. high, with bole 30–40 ft., grey aromatic bark thinly stripping off, and branchlets covered with rusty scales : fruit a yellow fleshy capsule with 4–5 seeds.
Ivory Coast : Abolsso (Apr.) ! Azaguié (Sept.) ! Yapo (Oct.) ! Gold Coast : Tano R. ! Akotiase (fr. Mar.–Sept.) ! Also in Angola. Exsicc.—*Thompson* 8. *Vigne* 933. (See Appendix).
2. **T. Zenkeri** *Harms* in Engl. Bot. Jahrb. 23 : 156. A tree about 60 ft., with pinnate leaves 2–3 ft. long and 20–30 leaflets ; petiole flat above towards the base.
Cameroons Mt. : Buea (Feb.) ! Also in French Cameroons, Congo and Angola. Exsicc.—*Dalz.* 8209.
3. **T. Vignei** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A medium-sized tree with dull yellow rusty-tomentellous flowers.
Gold Coast : Nfoum, Cape Coast district (Apr.–June) ! Exsicc.—*Vigne* 948. (See Appendix).
4. **T. Mannii** *Baill.* l.c. 261. A shrub 8–10 ft. high or ? a small tree ; branchlets glabrous but roughly lenticellate.
S. Nigeria : Calabra River (Feb.) ! Oban ! Exsicc.—*Mann* 2304. *Talb.* 1352.

10. TURRAEA Linn.—F.T.A. 1 : 330 ; Bak. f. in Journ. Bot. 1903 : 8.

Leaves sinuate-lobate or undulate on the margin, oblong or obovate, 4–10 cm. long, 2·5–5 cm. broad, pubescent on the nerves below, laxly reticulate ; lateral nerves 4–5 pairs ; flowers solitary to few on very short peduncles ; calyx deeply lobed, shortly pubescent ; petals linear-spathulate, about 2·5 cm. long, glabrous ; staminal column about 2·5 cm. long, slender, glabrous ; fruits about 1·5 cm. long ; seeds black, 6 mm. long, with a large red fleshy aril on the side .. .. .. 1. *heterophylla*

Leaves entire, elliptic-obovate, acuminate, 7–13 cm. long, 4–6 cm. broad, very slightly pubescent on the nerves below, laxly reticulate ; flowers subumbellate on fairly long peduncles ; pedicels about 7 mm. long ; calyx cupular, shortly toothed ; petals broadly spathulate, 1·5–2 cm. long, finely puberulous outside ; staminal column 1 cm. long ; fruits 2 cm. long ; seeds as above .. .. 2. *Vogelii*

1. **T. heterophylla** *Sm.*—F.T.A. 1 : 330 ; Bak. f. l.c. 10 ; Chev. Bot. 112. *T. lobata* Lindl. *T. quercifolia* Don. *T. graciliflora* Schlechtd. *T. gracilis* A. Chev. Bot. 111. A shrub or small tree 12–15 ft. high, with attractive white flowers.
Sierra Leone : Wallia, Scarcies R. (Feb.) ! Samu country, Mahela (Dec.) ! Hangha (Apr.) ! Ivory Coast : several localities ! Gold Coast : Cape Coast ! Accra Plains (Feb., Mar.) ! Togo : Lome ! S. Nigeria : Lagos ! Aguku ! Exsicc.—*Afzelius. Sc. Elliot* 4029 ; 4651. *Farmar* 500. *Dalz.* 8271. *Dodd* 421. *Warnecke* 205. *Chev.* 16773, etc. (Chev. Bot. 111).
2. **T. Vogelii** *Hook. f.*—F.T.A. 1 : 330 ; Bak. f. l.c. 11. A small tree with slender pubescent branchlets and white flowers in axillary umbels, sometimes a shrub in forests.
S. Nigeria : Lagos, Ikoyi ! Ajilite ! Benin, Oruru River (June) ! Oban ! Buea ! Johann-Albrechtshöhe ! Fernando Po, near the sea (Nov., Dec.) ! Extends to Uganda, Congo and Angola ; also in St. Thomas and Princes Islands. Exsicc.—*T. Vogel* 65 ; *Mann* 66. *Millen* 173. *Talb.* 1309. *Staudt* 478. *Deistel* 586. (See Appendix).

11. MELIA Linn.—F.T.A. 1 : 332.

Leaves bipinnate ; leaflets 4–6 pairs, ovate-lanceolate, long-acuminate, unequal-sided at the base, 3–8 cm. long, 1–3 cm. broad, serrate, glabrous or nearly so ; panicles subcorymbose, nearly as long as the leaves ; pedicels up to 1 cm. long, slightly pubescent ; sepals elliptic, pubescent, 2·5 mm. long ; petals contorted, oblanceolate, about 8 mm. long, thinly pubescent ; staminal column 7–8 mm. long, slender, glabrous, anthers within the apex ; fruit ellipsoid, drupaceous, usually 5-celled, 1–1·5 cm. long .. .. *Azedarach*

M. Azedarach *Linn.*—F.T.A. 1 : 332 ; Holl. 1 : 144 ; Chev. Bot. 112. A medium-sized tree, native of India introduced for ornament, with abundant panicles of lilac flowers.
Naturalised and widely distributed in tropical and subtropical countries. (See Appendix).

106. SAPINDACEAE

Trees, shrubs or climbers. Leaves alternate or rarely opposite, simple or pinnate ; stipules rarely present. Flowers actinomorphic or zygomorphic, sometimes very small, mostly unisexual, variously arranged. Sepals imbricate or rarely valvate. Petals 3–5, sometimes absent, imbricate. Disk usually present, sometimes unilateral. Stamens hypogynous, often 8, inserted within the disk or unilateral ; filaments free, often hairy ; anthers 2-celled. Ovary superior, entire or vertically lobed to the base, 1–4-celled ; style terminal or gynobasic ; ovules 1–2, rarely many in each cell, axile. Fruit capsular or indehiscent, rarely winged. Seeds without endosperm, often conspicuously arillate ; embryo with usually plicate or twisted cotyledons.

A fairly large and mostly tropical family, with reduced unisexual flowers and often pinnate leaves ; no endosperm.

Leaves pinnate with an odd terminal leaflet or trifoliolate or simple :
Climbing shrubs or herbs, the peduncle bearing circinately coiled tendrils :
Woody ; fruits firm, not bladder-like, turbinate, slightly 3-lobed at the top ; flowers racemose .. .. 1. **Paullinia**
Herbaceous ; fruits bladder-like and membranous .. .. 2. **Cardiospermum**

Shrubs or trees without tendrils :
Flowers in slender often pendulous racemes or panicles of racemes ; leaves trifoliolate or 1-foliolate ; fruits not winged .. .. 3. **Allophyllus**
Flowers paniculate or subracemose ; leaves simple ; fruits flat, broadly winged, wings membranous ; branches and leaves viscid .. .. .. 4. **Dodonaea**
Leaves pinnate without an odd terminal leaflet ; no tendrils :
Fruit dehiscent ; petals present :
Calyx with free sepals imbricate in 2 series ; stamens 10 ; fruit obtusely 3-angled 5. **Laccodiscus**
Calyx with slightly imbricate sepals or small and toothed :
Calyx deeply lobed :
Stamens 8–10 :
Stamens 10 ; fruit shortly ellipsoid with 3 longitudinal furrows ; seed completely invested by a fleshy covering .. .. 6. **Lychnodiscus**
Stamens usually 8 ; fruit pear-shaped, obtusely 3-angled ; seeds black with a large cupular aril .. .. 7. **Blighia**
Stamens 7 ; petals with 2 scales ; seed with a fleshy covering up to the middle 8. **Aporrhiza**
Calyx small, toothed, soon open in bud :
Petals with scales at the base, sometimes united :
Petals with free entire scales ; disk free .. .. .. 9. **Eriocoelum**

FIG. 173.—PAULLINIA PINNATA *Linn.* (SAPINDACEAE).

A, portion of shoot. B, flower. C, same in vertical section. D, disk glands. E, stamen. F, ovary in cross section. G, H, fruits.

Petals funnel-shaped through the concrescence of the scales ; disk united with the ribs of the calyx .. .. 10. **Phialodiscus**
Petals without scales at the base ; seeds covered with a tomentose aril ; capsule thin and bladdery, 2-lobed and 2-celled .. .. .. 11. **Harpullia**
Fruits indehiscent :
Fruits vertically lobed to the base, mostly only 1 lobe fertile, with a basal style :
Leaflets 1–2 pairs ; ovary syncarpous .. .. 12. **Aphania**
Leaflets more than 2 pairs ; ovary apocarpous .. .. .. 13. **Deinbollia**
Fruits laterally lobed or entire, with a terminal style :
Petals present :
Fruit fleshy ; inflorescences clustered on the old wood :
Stamens 12–15 .. .. 14. **Glossolepis**
Stamens 8.. .. .. 15. **Chytranthus**
Fruit leathery-crustaceous ; inflorescences on the young branches .. 16. **Pancovia**
Petals absent :
Stamens more numerous than the calyx-lobes :
Calyx 5-merous ; stamens 8–10 :
Stamens 8 ; aril absent .. .. 17. **Placodiscus**

Stamens 10; aril present .. .. 18. **Lecaniodiscus**
Calyx 4-merous; stamens 7–8; aril absent .. .. .. 19. **Melanodiscus**
Stamens as many as the calyx-lobes; flowers in head-like cymes at the ends of the branchlets; fruit a berry .. .. 20. **Zahna**

1. PAULLINIA Linn.—F.T.A. 1 : 419.

Branchlets softly pubescent to nearly glabrous, ribbed; leaves imparipinnate; rhachis conspicuously winged, wings leafy; leaflets 2 pairs and an odd one, opposite, oblong to obovate, rather coarsely and remotely toothed, glabrous to pubescent below and with hairy pits in the axils of the nerves; flowers racemose; peduncle axillary, stout, with one or two spirally coiled tendrils at the apex, with a short raceme of clustered small flowers beyond; capsule woody, turbinate, slightly 3-lobed at the top, shortly beaked, about 3 cm. long; septa spongy .. .. .. *pinnata*

P. pinnata *Linn.*—F.T.A. 1 : 419; Holl. 1 : 166; Chev. Bot. 148. A woody climber with tendrils, small white flowers and scarlet capsular more or less 3-angled fruit.
Common all over tropical Africa, in Madagascar, and in tropical America. (See Appendix).

2. CARDIOSPERMUM Linn.—F.T.A. 1 : 417.

Stems usually pilose with long weak spreading hairs; leaflets more or less ovate, coarsely toothed or almost lobate, acute or broadly acuminate, pilose especially on the midrib and in the axils of the nerves below; flowers nearly 1 cm. long; fruits about 5 cm. long, shortly cuneate at the base, reticulate, glabrous except sometimes on the main nerves .. .. 1. *grandiflorum*

Stems never pilose; leaflets rather deeply and irregularly cut, more or less gradually and long-acuminate, not hairy in the axils of the nerves but with a few scattered hairs on the nerves themselves; flowers small, about 3 mm. long; fruits 3–4 cm. long, more or less 3-winged, pubescent all over.. .. .. .. 2. *Halicacabum*

1. **C. grandiflorum** *Swartz* Prodr. 64. *C. barbicaule* Bak.—F.T.A. 1 : 418. *C. Caillei* A. Chev. Bot. 148, name only. Herbaceous climber with cream-white fragrant flowers, a pair of tendrils at the apex of the inflorescence, and more or less 3-angled bladdery fruits.
Fairly common from French Guinea to Nigeria, extending to Uganda, East Africa and Angola; also in tropical America. Exsicc.—*Mann* 1299. *Monteiro. Sc. Elliot* 4680. *Millson* 39. *Rowland. Millen* 79. *Cummins* 56; 75. *Caille* ex *Herb. Chev.* 14959. (See Appendix).
2. **C. Halicacabum** *Linn.*—F.T.A. 1 : 417; Holl. 1 : 165; Chev. Bot. 149. *C. microcarpum* Bak.—F.T.A. 1 : 418, ? of H. B. & K. A slender climber like the last but with smaller flowers and fruits.
Throughout the tropics. Exsicc.—*Heudelot. Roger. T. Vogel* 35. *E. Vogel* 80. *Barter* 429. *Mann* 406. *Sc. Elliot* 4101. *Rowland.* (See Appendix).

3. ALLOPHYLUS Linn.—F.T.A. 1 : 420 (as *Schmidelia* Linn.); Bak. f. in Journ. Bot. 57 : 154.

Leaves trifoliolate :
Leaflets toothed :
Leaflets comparatively small, not more than 12 cm. long :
Inflorescence simple or subsimple :
Petiole pilose with long weak spreading hairs, 4–6 cm. long, nearly as long as the leaflets; leaflets obovate, rather distantly serrate or rarely slightly lobulate, the terminal one the largest, up to 12 cm. long and 5 cm. broad, more or less pilose below; racemes very slender; fruit subglobose, 7–8 mm. diam. .. 1. *spicatus*
Petiole shortly pubescent with ascending hairs :
Petiole shorter than the leaflets, the latter elliptic-obovate, serrate, acute, up to about 8 cm. long and 5 cm. broad, setulose-pubescent above, nearly glabrous below; racemes pedunculate, about 1½ times as long as the leaves; fruits obovoid-ellipsoid .. .. 2. *Warneckei*
Petiole about as long as the lateral leaflets, the latter more or less obovate, crenate, subacute, 8–10 cm. long, 1·5–5 cm. broad, puberulous on the midrib and lateral nerves below; inflorescence usually about as long as the leaves; fruits ellipsoid, about 8 mm. long, at length glabrous .. .. 3. *africanus*
Inflorescence much-branched :
Petioles at most only shortly pubescent :
Branches of inflorescence (when present) ascending, slender; for further characters see above .. .. 3. *africanus*
Branches of inflorescence spreading almost at right angles, stiff, rough with the persistent peg-like pedicels; fruits obovoid, contracted at the base, 1 cm. long, glabrous, black when dry; leaflets bullate, obovate-elliptic, 8–12 cm. long, up to 7 cm. broad, the main lateral nerves with a tuft of hairs in the axil 4. *bullatus*
Petioles pilose with long slender hairs; for further characters see above 1. *spicatus*
Leaflets large, usually well over 15 cm. long and 10–12 cm. broad, obovate, cuneate at the base, rather long-acuminate, denticulate, glabrous or nearly so below, with about 12 pairs of lateral nerves and lax reticulate tertiary nerves; petiole about ¾ as long as the lateral leaflets panicles slender, with few branches 5. *megaphylla*

FIG. 174.—CARDIOSPERMUM GRANDIFLORUM *Swartz* (SAPINDACEAE).
A, inflorescence and leaf. B, fruits. C, flower. D, stamens. E, petal with adnate scale.

Leaflets entire, obovate, obtusely acuminate, shortly cuneate at the base, 7–9 cm. long, 3–4·5 cm. broad, very thin and glabrous ; petiole nearly as long as the lateral leaflets, glabrous ; panicles longer than the leaves, slender, with few branches, very slightly puberulous .. .. 6. *Talbotii*

Leaves 1-foliolate :

Leaflet abruptly caudate-acuminate, broadly obovate-elliptic, 12–18 cm. long, 6–10 cm. broad, crenate, more or less tomentose on each side of the midrib below ; racemes slightly longer than the petiole, about 3 cm. long .. .. .. 7. *hirtellus*

Leaflet gradually and rather triangular-acuminate, narrowly elliptic-obovate, 12–18 cm. long, 4–7 cm. broad, distantly denticulate, pilose in the axils of the principal nerves below, otherwise glabrous ; racemes as above .. .. .. 8. *nigericus*

1. **Allophylus spicatus** *Radlk.* in Engl. & Prantl, Pflanzenfam. 3, 5 : 312. *Schmidelia spicata* DC. *S. magica* Bak.—F.T.A. 1 : 423. *S. touraca* A. Chev. Bot. 150. A shrub with slender racemes of small white sweet-scented flowers.
French Sudan : Gourma, Konkobiri, etc. Sierra Leone : Berria (Mar.) ! Ivory Coast : Middle Sassandra, Guidéko to Soubré ; Mankono ; Ady, Station Agricole ; Upper Sassandra, Dyola country (May) ! Dahomey : Atacora Mts., 1,800 ft. (June) ! N. Nigeria : Nupe ! Lokoja ! Yola, on rocks (July) ! Zaranda Filani (May) ! S. Nigeria : Olokemeji ! Exsicc.—*Barter* 562 ; 1648. *Sc. Elliot* 5411. *Dalz.* 175. *Foster* 96. *Lely* 187. *Chev.* 21510 ; 24100, etc.
2. **A. Warneckei** *Gilg* ex Bak. f. l.c. 185. A shrub like the preceding.
Gold Coast : Accra Plains ! Togo ; near Lome ! Exsicc.—*Irvine* 683. *Warnecke* 160 ; 376.
3. **A. africanus** *P. de Beauv.* Fl. Oware 2 : 75, t. 107 ; Stapf 590 ; Bak. f. l.c. 188. *Schmidelia africana* DC.—F.T.A. 1 : 421 ; Holl. 1 : 167 ; Chev. Bot. 149. Usually a shrub 10–12 ft. high, glabrous or pubescent, sometimes becoming a tree 30 or more ft. high branching low down ; flowers creamy white, in almost catkin-like racemes, sweet-scented.
Widely distributed in tropical Africa. Exsicc.—*Heudelot* and others. *T. Vogel* 16 ; 18 ; 36 ; 105. *Irving* 117. *Barter* 524 ; 1095. *Mann* 487. *Talb.* 3351. *Pobéguin* 265 ; 743. (See Appendix).
4. **A. bullatus** *Radlk.* in Sitzb. Akad. Muench. 38 : 223, 237. *Schmidelia abyssinica* Hook. f., not of Hochst. A tree 30–40 ft. high.
Cameroons Mt. : 7,000 ft. ! Exsicc.—*Mann* 1184 ; 2167.
5. **A. megaphylla** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *A. grandifolius* Bak. f. 185, partly. A shrub with lenticellate branchlets and large leaves.
S. Nigeria : Oban ! Also in French Cameroons. Exsicc.—*Talb.* 414 ; 1393.
6. **A. Talbotii** *Bak. f.* l.c. 186. *Schmidelia nuonensis* A. Chev. Bot. 150.
Ivory Coast : Upper Nuon Basin (Apr.) ! S. Nigeria : Oban ! Exsicc.—*Talb.* 1713. *Chev.* 21147.
7. **A. hirtellus** *Radlk.* in Engl. & Prantl, Pflanzenfam. 3, 5 : 313 ; Bak. f. l.c. 158 (excl. var.). *Schmidelia hirtella* Hook. f. Niger Fl. 248, t. 25—F.T.A. 1 : 424. A shrub with white flowers.
Fernando Po : Clarence Cove (Nov.) ! Exsicc.—*Roster in "Herb. Vogel"* 96.
8. **A. nigericus** *Bak. f.* l.c. 158. *A. hirtellus* var. *Barteri* Bak. f. l.c. A shrub 15–20 ft. high ; flowers white.
S. Nigeria : Angiama ! Oban ! Ambas Bay (Jan.) ! Exsicc.—*Barter* 85. *Mann* 727. *Talb.* 442 ; 447 ; 1392.

Imperfectly known species.

A. Oreodryadum *Gilg* in Wiss. Ergebn. Deutsch. Zentr. Afr. Exped. 2 : 186, name only.
Cameroons Mt. Exsicc.—*Mildbraed.*

4. DODONAEA Linn.—F.T.A. 1 : 433.

A viscid shrub or small tree ; branchlets angular, not hairy ; leaves simple, subsessile, oblanceolate, obtusely apiculate, narrowed to the base, 7–12 cm. long, 2–3·5 cm. broad, thin, glabrous, with numerous spreading lateral nerves ; flowers unisexual or polygamous in small terminal panicles or subracemose ; pedicels slender, up to 1·5 cm. long in fruit ; petals absent ; stamens 5–8 ; fruit suborbicular, deeply emarginate, 2- or more-winged, up to 3 cm. diam., wings membranous, reticulate .. *viscosa*

D. viscosa *Linn.*—F.T.A. 1 : 433 ; Stapf 591 ; Chev. Bot. 154. A plant of sandy shores and estuaries, common in tropical and subtropical regions. (See Appendix).

5. LACCODISCUS Radlk. in Sitzb. Math.-Phys. Akad. Muench. 9 : 496 (1879).

Leaflets dentate in the upper half, 3–5 pairs, oblong-elliptic, shortly cuneate and unequal-sided at the base, caudate-acuminate, 7–22 cm. long, 4–10 cm. broad, setose-pilose on the midrib below ; branchlets, inflorescence and leaf-rhachis hirsute, with long rusty setose hairs ; panicles terminal, with long slender branches, the flowers subsessile in the axils of conspicuous subulate bracts ; buds ellipsoid, dark brown-tomentose when dry ; sepals 5 ; petals 5, villous inside ; stamens central, filaments pilose ; anthers linear, apiculate ; fruits subglobose, about 1·5 cm. diam., setulose outside, very setose inside .. .. 1. *ferrugineus*

Leaflets entire, very abruptly and narrowly triangular-acuminate, broadly oblong-elliptic, rounded at the base, setose-pubescent below ; other characters more or less as above, but panicles on the main stem .. .. 2. *cauliflorus*

1. **L. ferrugineus** *Radlk.* l.c. *Cupania ferruginea* Bak.—F.T.A. 1 : 425. A tree 15–20 ft. high or a climbing shrub.
Fernando Po (Jan.) ! Also in Spanish Guinea. Exsicc.—*Mann* 189.
2. **L. cauliflorus** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A small tree with black inflorescence.
Gold Coast : Amaneakrom (Sept.) ! Exsicc.—*Chipp* 372.

6. LYCHNODISCUS Radlk. in Sitzb. Math.-Phys. Akad. Muench. 8 : 332 (1878).

Branchlets ribbed, puberulous ; leaves paripinnate ; leaflets about 6 pairs, opposite or subopposite, oblong, subabruptly acuminate, shortly cuneate at the base, 6–12 cm.

long, 3–4 cm. broad, glabrous, closely reticulate below, dentate in the upper third; flowers in terminal pubescent panicles shorter than the leaves; pedicels very short and thick .. .. *reticulatus*

L. reticulatus *Radlk.* l.c. 333. A tree 30 ft. high.
Fernando Po ! Exsicc.—*Mann* 1422.

7. BLIGHIA Koenig—F.T.A. 1 : 426.

Branchlets and leaf-rhachis thinly tomentellous; leaflets 3-5 pairs, alternate or opposite (on the same shoot), elliptic to obovate, rounded or slightly pointed at the apex, slightly cuneate at the base, 5–12 cm. long, 3–6 cm. broad, slightly pubescent on the 8–12 pairs of very prominent nerves below; racemes up to 20 cm. long, thinly pubescent; calyx-lobes oblong, 2·5 mm. long, tomentellous; petals pubescent; fruit obovoid, slightly 3-lobed, 5–7 cm. long, valves coarsely wrinkled when dry; seeds oblong, black, with a large white cupular aril .. .. *sapida*

B. sapida *Koenig*—F.T.A. 1 : 426; Holl. 1 : 167; Chev. Bot. 153. A tree 20–50 ft. high with ribbed branchlets, greenish-white fragrant flowers, and capsular fruit brilliant red when ripe.
French Guinea: Kouroussa (Apr.) ! Kankan; Beyla (Mar.) ! Sierra Leone: Freetown (planted) ! Jalahun ! Ivory Coast and Gold Coast: common in forests or planted in towns, especially N.T. Gold Coast ! Dahomey: Zagnanado, Kétou (Feb.) ! Abomey; Adjara. N. Nigeria: Nupe ! Kontagora (planted Feb.) !

FIG. 175.—BLIGHIA SAPIDA *Koen.* (SAPINDACEAE).

A, inflorescence and leaf. B, flower. C, same in vertical section. D, stamen. E, cross section of ovary. F, fruit. G, same after dehiscence showing arillate seeds.

Agaie (in towns, Nov., Dec.) ! S. Nigeria: Lagos (planted) ! Benin ! Also in French Cameroons, St. Thomas and Princes Islands; cultivated in India and tropical America. Exsicc.—*Barter* 1004; 2140. *Moloney*. *Johnston* 69. *Johnson* 815. *Dawodu* 5. *Dalz.* 282; 1386. *Chipp* 508. *Brent* 547. *Pobéguin* 686. (See Appendix).

8. APORRHIZA Radlk. in Sitzb. Math.-Phys. Akad. Muench. 8 : 338 (1878).

Branchlets and leaf-rhachis rusty-puberulous; leaflets 5–7 pairs, oblong-elliptic, obtusely acuminate, obtuse at the base, 10–15 cm. long, 3–5·5 cm. broad, shortly pubescent on the midrib and nerves below; lateral nerves about 15 pairs, closely reticulate between; flowers in lax terminal panicles about 30 cm. long with ascending branchlets; calyx-lobes oblong, about 3·5 mm. long, tomentellous; petals hairy, longer than the calyx; fruit with one cell often aborted, the other about 1 cm. diam., tomentellous
Talbotii

A. Talbotii *Bak. f.* in Cat. Talb. Nig. Pl. 20. *A. rugosa* A. Chev. Bot. 153, name only. A tree 20–30 ft. high.
Sierra Leone: Ronietta (Nov.) ! Bumbuma (Oct.) ! Ivory Coast: near Bingerville. S. Nigeria: Oban ! Exsicc.—*Talb.* 416; 1292. *Chev.* 15249. *Thomas* 3691; 5597; 10218.

Imperfectly known species.

A. rugosa *A. Chev.* Bot. 153, name only.
Ivory Coast: near Bingerville. Exsicc.—*Chev.* 15249.

9. ERIOCOELUM Hook. f.—F.T.A. 1 : 427.

Racemes long and slender, pendulous; leaflets about 3–4 pairs, the lowermost pair at the base of the rhachis and resembling leafy stipules, the others obovate-elliptic,

broadly acuminate, acumen long-mucronate, 6–13 cm. long, 2·5–5·5 cm. broad, pubescent on the midrib below, closely reticulate; rhachis rusty-pilose; pedicels 5 mm. long; fruits depressed-triangular, 2·5 cm. broad, setose-pubescent, woolly within the cells, the shell very thin and crustaceous .. .. 1. *racemosum*

Racemes short, not pendulous, often branched at the base; leaflets about 2 pairs, the lowermost pair ovate-orbicular, the others obovate, cuneate at the base, obtusely pointed or emarginate, 12–20 cm. long, 4–7 cm. broad, slightly pubescent on the midrib below, finely reticulate; rhachis pubescent; pedicels 3–4 mm. long; fruits woody, depressed-globose, about 3·5 cm. diam., glabrous and smooth outside, densely woolly within, the shell thick and woody .. .. 2. *Kerstingii*

1. **Eriocoelum racemosum** *Bak.*—F.T.A. 1 : 427; Chev. Bot. 154, partly. *E. pendulum* Stapf 590. *E. pungens* Radlk. *E. macrocarpum* Gilg; Chev. Bot. 184. A shrub or small tree, the branchlets with spreading rusty pubescence; small white flowers in rusty brown inflorescences up to 1 ft. long.
Sierra Leone: Bagroo River (Apr.)! Falaba (Apr.)! Panguma (Apr.)! Liberia: Monrovia! Kakatown! Ivory Coast: Abidjean, Dabou! Grabo to Taté. Gold Coast: Tano River, Amaneakrom (Sept.)! Exsicc.—*Mann* 807. *Whyte. Aylmer* 50. *Lane-Poole* 99. *Chipp* 373. *Chev.* 15236. (See Appendix).

2. **E. Kerstingii** *Gilg* in Engl. Pflanzenw. Afr. 3, 2 : 282, fig. 136. *E. racemosum* A. Chev. Bot. 154, partly, not of Bak. A tree about 30 ft. high with brownish-pubescent inflorescence.
French Sudan: Gourma, Konkobiri! Sierra Leone: Farana! Togo; Sokode! N. Nigeria: Naraguta (Dec.)! S. Nigeria: Asaba! Also in Lake Chad district and French Cameroons. Exsicc.—*Sc. Elliot* 5234. *Kersting* A. 257; A. 518. *Chev.* 24324. *Lely* 734. *Leslie.* (See Appendix).

10. PHIALODISCUS Radlk. in Sitzb. Math.-Phys. Akad. Muench. 9 : 497, 655 (1879).

Branchlets appressed-puberulous; leaves paripinnate, usually 2 pairs, occasionally 1 or 3 pairs; leaflets opposite, oblanceolate to obovate-elliptic, shortly and broadly acuminate, more or less narrowed to the base, up to 20 cm. long and 10 cm. broad, glabrous except for a few hairs in the axils of the lateral nerves; male racemes axillary, rather short; pedicels 5 mm. long, pubescent; calyx with broad triangular teeth; stamens with hairy anthers and filaments; fruits top-shaped, about 3·5 cm. long, slightly 3-lobed, lobes narrowly winged; seeds shining, with a cupular basal aril *unijugatus*

P. unijugatus *Radlk.* l.c. 655; Chev. Bot. 154. *Blighia unijugata* Bak.—F.T.A. 1 : 427; Chev. Bot. 154. A tree with strongly scented flowers, red fruits with black seeds and yellow aril.
Throughout the forest area! and probably in Angola. Exsicc.—*Sc. Elliot* 5791. *Lane-Poole* 8; 70. *Dalz.* 8258; 8288. *Chipp* 137. *Vigne* 133. *Brent* 548. *Chev.* 23288. *Mann* 760. (See Appendix).

11. HARPULLIA Roxb. Hort. Beng. 86 (1814).

Branchlets puberulous; leaflets alternate, 5–11 pairs, sessile, oblong, obtusely acuminate, 6–9 cm. long, 2–3·5 cm. broad, glabrous; flowers in dense terminal panicles; sepals tomentellous; stamens glabrous within the large fleshy disk; fruits very broadly turbinate, about 4·5 cm. wide, puberulous, thin, opening into the cells; seeds bluish, ellipsoid, softly tomentellous, 1·5 cm. long .. .. *Fosteri*

H. Fosteri *Sprague* in Kew Bull. 1908 : 433. *H. multijuga* Radlk. *Anoumabia cyanosperma* A. Chev. Bot. 155. A tree up to 100 ft. or more high, with angled branchlets and 30–40 ft. bole; flowers greenish-brown, purple within; fruit reddish, membraneous; sometimes flowering in the young state.
Ivory Coast: Anoumaba (Nov.)! Bouroukrou (Dec.–Jan.)! Morénou, between Sahoua and Bangouanou (Nov.)! Bingerville and environs. Also in French Cameroons, Upper Congo and Uganda. Exsicc.—*Chev.* 15165; 16150; 16950; 22413; 22443.

12. APHANIA Blume Bijdr. 236 (1825).

Branchlets thinly pubescent; leaflets 1 or 2 pairs, opposite, with very short swollen petiolules, broadly oblanceolate to obovate-elliptic, very obtusely pointed, shortly cuneate at the base, 8–15 cm. long, 3–6 cm. broad, strongly reticulate on both surfaces, glabrous; flowers polygamous in rather lax terminal panicles; bracts and sepals ciliate; petals present; stamens 7–8, filaments villous; ovary didymous, one carpel usually abortive, glabrous; fruits obovoid, about 1·8 cm. long, with a basal style and the abortive carpel persisting at the base .. .. 1. *senegalensis*

Branchlets, etc., more or less as above, but leaflets elongate-oblong, broadly acuminate, gradually narrowed into the longer petiolule; fruits ellipsoid, about 1·2 cm. long 2. *silvatica*

1. **A. senegalensis** *Radlk.* in Sitzb. Math.-Phys. Akad. Muench. 8, 238; Chev. Bot. 151. *Sapindus senegalensis* Poir.—F.T.A. 1 : 430. Tree up to 30 ft. high.
Senegal: Casamance (Feb.)! Walo! Richard Tol! French Guinea: Konakry. Ivory Coast: Ano (Dec.)! Togo: near Lome! Dahomey: Dassas country (May). Extends to Abyssinia and Kenya Colony; also in Angola. Exsicc.—*Chev.* 3031; 22561. *Heudelot. Warnecke* 42. (See Appendix).

2. **A. silvatica** *A. Chev.* Bot. 152, name only. Small tree near river.
Ivory Coast: Cavally Basin (Aug.)! Gold Coast: Tano River (Sept.)! Exsicc.—*Chev.* 20064. *Chipp* 345.

13. DEINBOLLIA Schum. & Thonn.—F.T.A. 1 : 431.

Inflorescence linear-oblong with very short lateral branchlets bearing clustered flowers, occasionally with one or two longer lateral branchlets at the base:

Leaflets alternate or subopposite, rounded at the base, ovate or oblong-elliptic, gradually and broadly acuminate, up to 15 cm. long and 8 cm. broad, pubescent below;

rhachis pubescent; inflorescence elongated and rather dense-flowered, narrow; sepals rusty-tomentellous outside; ovary tomentellous; fruits globose, about 1·4 cm. diam., with a basal style .. .. 1. *pinnata*

Leaflets alternate, about 5 on each side, acutely cuneate at the base, oblong-obovate, long- and rather broadly acuminate, 10–18 cm. long, 3–7 cm. broad, thinly papery, glabrous, laxly reticulate on both sides; rhachis of leaf glabrous; inflorescence elongated, very narrow; sepals slightly puberulous outside; stamens 8 .. 2. *cuneifolia*

Inflorescence with numerous spreading more or less elongated lateral branches:

Sepals quite glabrous outside; leaflets alternate, broadly oblong-elliptic or broadly elliptic, obtusely acuminate, rather rounded at the base, up to 27 cm. long and 10 cm. broad, glabrous and closely reticulate below; inflorescence pyramidal, nearly glabrous, up to 30 cm. long .. .. 3. *grandifolia*

Sepals more or less puberulous outside

Flowers 2–3 to each little branchlet of the inflorescence, the latter very long and narrow; sepals puberulous outside; leaflets alternate, elliptic, very shortly and obtusely acuminate, rounded or shortly cuneate at the base, glabrous, 18 cm. long, 8 cm. broad .. .. 4. *insignis*

Flowers several (5 or more) to each lateral branchlet of the inflorescence, the latter broadly pyramidal:

Leaflets oblong or oblong-oblanceolate, acutely acuminate, shortly cuneate at the base, 18–25 cm. long, 4–7 cm. broad, glabrous; pedicels very short and crowded, the flowers falling and leaving a prominent scar; stamens 13–14 .. 5. *polypus*

Leaflets broadly elliptic, broadly acuminate, obtuse, unequal-sided and cuneate at the base, about 20 cm. long and 8–9 cm. broad, glabrous and closely reticulate below; lateral branchlets of inflorescence elongated, up to 18 cm. long; ovary glabrous .. .. 6. *maxima*

1. **Deinbollia pinnata** *Schum. & Thonn.*—F.T.A. 1 : 432; Chev. Bot. 151. *D. dahomensis* A. Chev. Bot. 151. *D. leptophylla* Gilg. A shrub or small tree with long panicles of violet or white flowers and red fruits. Throughout the area.
2. **D. cuneifolia** *Bak.*—F.T.A. 1 : 432; Chev. Bot. 150. A small shrub with yellowish-white flowers and reddish-yellow fruits.
French Guinea: Farana, at Niger sources; between Timbikounda and Farakoro; Konanké country. Sierra Leone: Bagroo River! Kabusa (Apr.)! Sugarloaf Mt. (May)! Ivory Coast: Bingerville, Abidjean; Grabo, Tepo country; on basaltic hills of Mt. Copé. Exsicc.—*Mann* 831. *Barter* (no number). *Sc. Elliot* 5475.
3. **D. grandifolia** *Hook. f.* Nig. Fl. 250; Stapf 591. *D. indeniensis* A. Chev. Bot. 151. *D. insignis* Bak.—F.T.A. 1 : 431, partly, not of Hook. f. A tall tree with yellowish-white flowers in clusters forming a large panicle.
Sierra Leone: Talla Hills (Feb.)! Limba (Apr.)! Liberia: Cape Palmas (July)! Kakatown! Ivory Coast: Indénié, Zaranou (Mar.)! Bingerville, Abidjean! Gold Coast: Moinsi Hills! Exsicc.—*Sc. Elliot* 5008; 5594. *Whyte. Chev.* 15513; 17619. *T. Vogel* 66. (See Appendix).
4. **D. insignis** *Hook. f.*—F.T.A. 1 : 431, partly. Tree 12–18 ft. high; calyx green; corolla yellow.
Fernando Po! Exsicc.—*Mann* 159. *T. Vogel* 166.
5. **D. polypus** *Stapf* in Journ. Linn. Soc. 37 : 91. *D. calophylla* Gilg *ex* Engl., name only. A glabrous shrub or tree; flowers whitish in almost sessile fascicles forming a stiff panicle.
Liberia: Sino Basin! Kakatown! Grand Bassa! Exsicc.—*Whyte. Dinklage* 1887.
6. **D. maxima** *Gilg* in Engl. Pflanzenw. Afr. 3, 2 : 272.
S. Nigeria: Oban! Also in French Cameroons. Exsicc.—*Talb.* 1290.

14. GLOSSOLEPIS Gilg in Engl. Bot. Jahrb. 24 : 299 (1897).

A tree; leaflets 8–9 pairs, oblong, obtusely and broadly acuminate, shortly cuneate at the base, 15–20 cm. long, 5 cm. broad, glabrous, very finely reticulate on both surfaces, with about 12 pairs of lateral nerves; flowers few in clusters on racemes from the old wood; flower-buds obovoid, closely tomentellous; petals with a scale at the base; stamens about 12; disk large and excentric .. .. .. *Talbotii*

G. Talbotii *Bak. f.* in Cat. Talb. Nig. Pl. 20.
S. Nigeria: Oban! Exsicc.—*Talb.* 1686.

15. CHYTRANTHUS Hook. f.—F.T.A. 1 : 429.

Midrib glabrous or slightly puberulous below; leaflets elongate-oblong or oblong, elliptic, abruptly caudate-acuminate, cuneate at the base, 30–35 cm. long, 9–15 cm. broad, with about 25 pairs of prominent lateral nerves, finely reticulate between the nerves, glossy above; racemes clustered on the main branches (or stem), elongated, rusty purple; pedicels and calyx dark purple; calyx campanulate, 1 cm. long, lobed nearly to the middle; petals obovate-spathulate, a little longer than the calyx, puberulous; ovary and style bristly with purple hairs .. .. 1. *atroviolaceus*

Midrib setose with stiff spreading hairs below; racemes comparatively short:

Leaflets acute at the base, elongate-obovate, caudate-acuminate, 12–25 cm. long, 5–10 cm. broad, with about 20–22 pairs of lateral nerves prominent below, closely reticulate between; rhachis bristly-tomentose; racemes clustered, about 6 cm. long, brown-tomentose .. .. 2. *setosus*

Leaflets rounded or subcordate at the base, elliptic, broadly acuminate, 20–25 cm. long, 8–10 cm. broad, with about 14 pairs of very prominent nerves below; racemes up to 15 cm. long, very dense-flowered when young, covered with brown indumentum. 3. *ellipticus*

1. **Chytranthus atroviolaceus** *Bak. f.*, ined. *C. macrophyllus* var. *obanensis* Bak. f. A tree up to 60 ft. high, with large 5–6-jugate leaves.
   Sierra Leone: in forest near Heirakohun! S. Nigeria: Oban! Exsicc.—*Smythe* 126. *Talb.* 1583; 1596.
2. **C. setosus** *Radlk.* in Sitzb. Math.-Phys. Akad. Muench. 20 : 232; Chev. Bot. 152. Small tree 15 ft. high.
   Dahomey: Sakété (Jan.)! S. Nigeria: Calabar River (Feb.)! Also in French Cameroons. Exsicc.—*Mann* 2281.
3. **C. ellipticus** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A tree or shrub.
   S. Nigeria: Oban! Eket! Exsicc.—*Talb.* 1399; 3129.

16. PANCOVIA Willd. Sp. Pl. 2 : 285 (1799).

Leaflets rounded and emarginate or very shortly and obtusely pointed at the apex, 2 pairs, oblong-elliptic, rounded or shortly cuneate at the base, shining above, 8–12 cm. long, 2·5–6·5 cm. broad, prominently reticulate below; flowers in short racemes on the 1-year-old branchlets, tomentellous; pedicels up to 5 mm. long, tomentellous; ovary bilobed, tomentose .. .. 1. *bijuga*

Leaflets rather long-acuminate:

Flowers in short racemes or in clusters:

Flowers pedicellate in short racemes on the 1-year-old shoots; pedicels about 5 mm. long, tomentellous; leaflets 3–4 pairs, alternate or subopposite, oblong-elliptic, cuneate at the base, shining above, 7–15 cm. long, 2–5 cm. broad, glabrous; sepals strigose .. .. 2. *pedicellaris*

Flowers sessile in clusters on the young shoots; leaflets 1–2 pairs, opposite, obovate-elliptic, obtusely acuminate, cuneate at the base, 8–16 cm. long, 4–7 cm. broad, reticulate below .. .. 3. *sessiliflora*

Flowers in very long racemes (about 20–25 cm. long) on the older wood; pedicels 5 mm. long, scabrid-tomentellous; leaflets 3–4 pairs, opposite or subopposite, obovate, gradually acuminate, about 16 cm. long and 7 cm. broad, glabrous; lateral nerves 6–8 pairs, slender .. .. 4. *polyantha*

1. **Pancovia bijuga** *Willd.* Sp. Pl. 2 : 285; Chev. Bot. 152. *P. turbinata* Radlk. "*P. guineensis* Willd."—A. Chev. Bot. 152. *Erioglossum cauliflorum* Guill. & Perr. Tent. Fl. Seneg. 1 : 118. t. 28. A tree 15–20 ft. high.
   Senegal: Casamance. Sierra Leone! Ivory Coast: Upper Sassandra (May)! Ano (Dec.)! Togo: Lome! S. Nigeria: Lagos Colony! Exsicc.—*Heudelot* 869. *Chev.* 22527; 22547; 22548. *Warnecke* 67. *Moloney*. *Afzelius*.
2. **P. pedicellaris** *Radlk. & Gilg* in Engl. Bot. Jahrb. 24 : 302. A shrub or small tree about 15–30 ft. high, with very hard wood.
   S. Nigeria: Johann-Albrechtshöhe (Feb.)! Also in French Cameroons. Exsicc.—*Staudt* 596.
3. **P. sessiliflora** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A climbing shrub, with small whitish flowers and red lobed fruit.
   S. Nigeria: Lagos, Ikoyi Plains (Feb.)! Exsicc.—*Dalz.* 1178.
4. **P. polyantha** *Gilg* in Engl. Pflanzenw. Afr. 3, 2 : 276.
   S. Nigeria: Johann-Albrechtshöhe (Mar.)! Exsicc.—*Staudt* 906.

17. PLACODISCUS Radlk. in Sitzb. Math.-Phys. Akad. Muench. 8 : 332 (1878).

Lowermost leaflet placed well above the base of the rhachis:

Flower-buds very small and puberulous-tomentellous; leaflets about 5 pairs, subopposite, oblong, acutely acuminate, shortly cuneate at the base, up to 30 cm. long and 10 cm. broad, very closely reticulate on both surfaces, glabrous; racemes elongated, up to 40 cm. long .. .. 1. *leptostachys*

Flower-buds about 5 mm. long, softly tomentose; leaflets similar to above but smaller and with shorter stalks; flowers subsessile; bracts subulate .. 2. *turbinatus*

Lowermost leaflet at the base of the rhachis and resembling a large leafy stipule, ovate; leaflets oblong, about 23 cm. long and 5·5 cm. broad, closely reticulate; flowers not seen; fruits entire or 2-lobed, obliquely ellipsoid, about 2·5 cm. long, glabrous, hard 3. *pseudostipularis*

1. **P. leptostachys** *Radlk.* l.c. 9 : 606. Tree 20 ft. high.
   Cameroons Mt.: 2,000–3,000 ft. (Dec.)! Also in French Cameroons and Mayombe. Exsicc.—*Mann* 2150.
2. **P. turbinatus** *Radlk.* l.c. 8 : 332. Small tree 15 ft. high.
   S. Nigeria: Calabar River (Feb.)! Exsicc.—*Mann* 2239.
3. **P. pseudostipularis** *Radlk.* l.c. 20 : 242; Chev. Bot. 152.
   Ivory Coast: Alépé; Grabo, on basaltic hills of Mt. Tou. Gold Coast! Exsicc.—*Burton & Cameron*. (See Appendix).

18. LECANIODISCUS Planch.—F.T.A. 1 : 428.

Branchlets thinly pubescent; leaves paripinnate; leaflets opposite or nearly so, with a short swollen petiolule, oblong or elliptic, broadly caudate-acuminate, cuneate at the base, 6–18 cm. long, 4–9 cm. broad, with rather numerous spreading lateral nerves, glabrous; racemes axillary, much shorter than the leaves, puberulous; flowers more or less clustered, polygamous or dioecious; pedicels about 5 mm. long, slender; petals absent; stamens 10, glabrous; ovary densely setose-tomentose; fruits broadly ovoid, 2 cm. long, often slightly 2-lobed, tomentellous, shortly beaked by the terminal style .. .. *cupanioides*

1. **cupanioides** *Planch.*—F.T.A. 1 : 429; Chev. Bot. 153. A shrub or small tree with yellowish-tomentose globose fruits.
   Throughout the area and south to Angola. (See Appendix).

19. MELANODISCUS Radlk. in Th. Dur. Ind. Gen. 75 (1888).

Branchlets softly pubescent ; leaflets 2 pairs, the lower pair small-ovate, near the base of the rhachis, the upper pair oblong-elliptic, gradually acuminate, obtuse at the base, about 15 cm. long and 6 cm. broad, pubescent on the midrib above ; rhachis pubescent ; flowers in a terminal softly pubescent panicle about as long as the leaves ; pedicels 4 mm. long, tomentose ; filaments glabrous .. .. *africanus*

M. africanus *Radlk.* l.c.
S. Nigeria : Lagos Colony ! Exsicc.—*Moloney*.

20. ZANHA Hiern in Cat. Welw. Afr. Pl. 1 : 128 (1896) (*Talisiopsis* Radlk.).

Branchlets glabrous ; leaflets about 3–4 pairs, subalternate, ovate or oblong, obtusely acuminate, slightly cuneate at the base, 4–9 cm. long, 2·5–3·5 cm. broad, glabrous ; rhachis glabrous ; flowers numerous in dense head-like cymes clustered at the apex of the branchlets ; peduncle puberulous ; sepals ovate ; ovary 2-celled, glabrous ; fruit 1-celled, indehiscent, ellipsoid. apiculate, 2 cm. long, wrinkled when dry *golungensis*

Z. golungensis *Hiern* l.c. *Talisiopsis oliviformis* Radlk. A large tree up to 50 ft. high, with spreading branches and small greenish flowers ; branchlets reddish-scaly when young, leafless at flowering.
Togo : Aledjo Kadara ! Woagburn Mts. ! Also in French Cameroons, Angola and E. Africa. Exsicc.—*Kersting* A. 548 ; A. 548a. (See Appendix).

107. MELIANTHACEAE

Shrubs or small trees. Leaves alternate, pinnate, stipulate ; stipules intrapetiolar, often large. Flowers hermaphrodite, rarely unisexual, racemose, zygomorphic. Calyx of 5 unequal segments, imbricate. Petals 5, free, subperigynous, clawed, unequal. Disk unilateral, lining the inside of the calyx. Stamens 4, inserted within the disk, free or variously connate, often declinate ; anthers 2-celled, opening lengthwise. Ovary 4–5-celled, superior ; style central, dentate or truncate ; ovules 1–4 in each cell, axile. Fruit a papery or woody capsule, loculicidally 4–5-valved or opening only at the apex. Seeds with copious endosperm and straight embryo.

Confined to Africa ; recognised by the pinnate leaves and intrapetiolar stipules, subperigynous petals, unilateral disk, and seeds with copious endosperm.

BERSAMA Fresen.—F.T.A. 1 : 433 ; Bak. f. in Journ. Bot. 1907 : 12.

Leaflets crenate or serrulate, oblong to oblanceolate, acutely acuminate :
Leaflets acute at the base, 6–15 cm. long, 2·2–6·5 cm. broad, thin, glabrous below, with 6–8 pairs of lateral nerves ; rhachis slightly ridged ; racemes slender, shorter than the leaves, slightly pubescent ; pedicels about 5 mm. long, puberulous ; petals tomentose ; fruits subglobose, about 2-4 cm. diam. .. .. 1. *paullinioides*
Leaflets rounded to subacute at the base, about 10 cm. long and 3·5 cm. broad, pubescent on the nerves below, with about 12 pairs of lateral nerves ; rhachis slightly winged near the top ; racemes elongate, longer than the leaves ; pedicels 1·5 cm. long, pubescent ; petals 1 cm. long, tomentellous .. .. .. 2. *Preussii*
Leaflets entire :
Leaf-rhachis not winged or only very narrowly so in the upper quarter :
Leaflets about 12 cm. long, oblong, acuminate, glabrous, with about 6–8 pairs of forked lateral nerves ; stipules persistent, ovate-lanceolate, acute, 3 cm. long, glabrous ; racemes about 15 cm. long ; pedicels 5 mm. long ; bracts linear, thinly pilose .. .. 3. *leiostegia*
Leaflets more or less as in preceding ; stipules appressed-villous, lanceolate-triangular, about 1·3 cm. long ; flowers similar to those of the next species .. 4. *subalata*
Leaflets up to 6 cm. long, about 12 pairs, lanceolate to elliptic-lanceolate, acutely acuminate, 3–7 cm. long, 1·3–3 cm. broad, shining, glabrous, with 10–12 pairs of lateral nerves ; stipules lanceolate, 1–2 cm. long, tomentellous ; racemes dense-flowered, about 15 cm. long ; pedicels 1 cm. long, puberulous ; petals about 1 cm. long, appressed-tomentose .. .. 5. *lobulata*
Leaf-rhachis rather broadly winged in the upper half ; leaflets about 6 pairs, lanceolate, gradually acuminate or acute, up to 13 cm. long and 4·5 cm. broad, slightly pubescent on the nerves, with about 10 pairs of lateral nerves ; stipules triangular, 1 cm. long, puberulous ; inflorescence shorter than the leaves, dense-flowered in the upper part ; pedicels about 6 mm. long ; petals 1 cm. long, appressed-tomentose .. .. 6. *pachythyrsa*

1. **Bersama paullinioides** *Bak.*—F.T.A. 1 : 435 ; Bak. f. l.c. 16 ; Chev. Bot. 155. *B. bolamensis* v. Brehm. A tree 40 ft. high, with white flowers and red capsular fruit, velvety outside, containing red arillate seeds.

Portuguese Guinea: Bolama! French Guinea: Futa Jallon, several localities. Sierra Leone: Mt. Leicester! Mahela (fr. Dec.)! Mt. Aureale! Pujehun-Basala Road! Njala! Ivory Coast: Bingerville; Attlé; Abidjean; Dabou. Fernando Po: 1,000 ft. (Dec.)! Exsicc.—*T. Vogel* 99. *Barter. Sc. Elliot* 4091. *Lane-Poole* 258. *Aylmer* 84. *Dalz.* 8073. *Mann* 641. *Rodrigues* 116. (See Appendix).

2. **Bersama Preussii** *Bak. f.* in Journ. Bot. 45: 16. Habit of the last; raceme many-flowered, over a foot long.
S. Nigeria: Barombi (Aug.)! Exsicc.—*Preuss* 408.

3. **B. leiostegia** *Stapf* in Journ. Linn. Soc. Bot. 37: 92; Bak. f. l.c. 16. A small tree 20 ft. high in evergreen forest.
Liberia: Sino Basin! Gold Coast: Abosso (Aug.)! Exsicc.—*Whyte. Vigne* 224.

4. **B. subalata** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A tree with stout yellowish-pubescent branchlets.
S. Nigeria: Oban! Exsicc.—*Talb.* 147.

5. **B. lobulata** *Sprague & Hutch.* in Talb. Cat. Nig. Pl. 21. A tree like the preceding.
S. Nigeria: Oban! Exsicc.—*Talb.* 1376.

6. **B. pachythyrsa** *v. Brehm.* in Engl. Bot. Jahrb. 54: 399. *B. Chippii* Sprague & Hutch., name only. A climber 30 ft. high or a small tree; flowers sweet-scented.
Gold Coast: Esuasu (May)! Asientiem (July)! Togo: Atakpame, Akgosso Forest (May)! Exsicc.—*Doering* 280. *Chipp* 217; 288.

108. ANACARDIACEAE

Trees or shrubs, often with resinous bark. Leaves alternate, very rarely opposite, simple or compound; stipules absent, very rarely present but obscure. Flowers hermaphrodite or unisexual, mostly actinomorphic. Calyx variously divided, sometimes semi-superior in fruit. Petals 3–7 or absent, free or rarely connate and adnate to the torus. Disk present. Stamens often double the number of the petals, rarely equal or numerous; filaments free among themselves; anthers 2-celled, opening lengthwise. Ovary superior, 1-celled, rarely 2–5-celled, or very rarely carpels free; styles 1–3, often widely separated; ovules solitary, pendulous from the apex or adnate to the ovary wall, or pendulous from a basal funicle. Fruit mostly drupaceous. Seeds without or with very thin endosperm; cotyledons fleshy.

Mainly a tropical family, and fairly abundant in tropical and South Africa; bark usually resinous.

Leaves compound:
Leaves pinnately 5- or more-foliolate:
Style terminal:
All the ovary-cells fertile; flowers in lax terminal panicles; stamens 4; leaflets opposite or subopposite .. .. 1. **Nothospondias**
Only 1 ovary-cell fertile:
Stamens not longer than the petals, the same number as or up to more than double the number of the petals .. .. 2. **Sorindeia**
Stamens longer than and the same number as the petals .. 3. **Trichoscypha**
Styles more or less on the shoulders of the ovary cells:
Petals imbricate; styles 3–4:
Sepals free:
Anthers long; leaflets opposite or subopposite; fruit obovoid; male flowers spicate .. .. 4. **Sclerocarya**
Anthers rounded; fruits broadly ellipsoid; flowers in lax panicles 5. **Pseudospondias**
Sepals more or less united at the base:
Petals 4; leaflets opposite .. .. 6. **Lannea**
Petals 3; leaflets alternate .. .. 7. **Haematostaphis**
Petals valvate; styles 5; leaflets opposite:
Fruits ovoid, not lobulate; flowers small in large lax terminal panicles 8. **Spondias**
Fruits depressed, 5–6-lobulate .. .. 9. **Antrocaryon**
Leaves always trifoliolate .. .. 10. **Rhus**
Leaves simple:
Stamens more than 1:
Inflorescence an oblong more or less spiciform panicle; lateral nerves very numerous and close; leaves silky below .. .. 11. **Heeria**
Inflorescence a pyramidal panicle; lateral nerves of leaves not very close; leaves elongate, acuminate, glabrous .. .. 12. **Mangifera**
Inflorescence a spreading dichotomous cyme; lateral nerves few; leaves broadly rounded or emarginate at the apex, glabrous .. .. .. 13. **Anacardium**
Stamen 1; inflorescence elongated; sepals and petals 4; lateral nerves of leaves few 14. **Fegimanra**

1. NOTHOSPONDIAS Engl. Bot. Jahrb. 36 : 216 (1905).

Branchlets puberulous ; leaves imparipinnate ; leaflets about 10 pairs, alternate, obliquely oblong-elliptic, obtusely acuminate, very unequal-sided at the base, 10–16 cm. long, 4–6·5 cm. broad, glabrous, with about 6 pairs of prominently looped lateral nerves ; petiolules about 5 mm. long ; flowers polygamous in lax terminal panicles, clustered ; pedicels up to 5 mm. long, shortly pubescent ; calyx campanulate, shortly dentate, 1·5 mm. long ; petals 6 mm. long, glabrous, slightly imbricate ; stamens 4 ; ovary sparingly pilose, 4-celled ; style short .. .. *Staudtii*

N. Staudtii *Engl.* l.c. 217. *N. Talbotii* S. Moore. A shrub or tree up to 40 ft. high, with glabrous branchlets. S. Nigeria : Oban ! Johann-Albrechtshöhe (Nov.) ! Exsicc.—*Talb.* 230. *Staudt* 746.

2. SORINDEIA Thouars—F.T.A. 1 : 439.

Leaflets with about 15 pairs of lateral nerves, lanceolate or oblong-lanceolate, shortly and obtusely acuminate, shortly cuneate at the base, about 15–20 cm. long and 4–6 cm. broad, glabrous ; flowers in lax rusty-puberulous panicles ; pedicels very short ;

FIG. 176.—SORINDEIA JUGLANDIFOLIA *Planch.* (ANACARDIACEAE).

A, leaf. B, flower. C, same in vertical section. D, fruiting branch. E, fruit in cross section.

calyx slightly 5-toothed ; petals valvate, glabrous ; stamens 5, with large anthers on short filaments .. .. 1. *longifolia*

Leaflets with fewer (up to 10) pairs of lateral nerves :

Leaflets rather long- and subcaudate-acuminate, 3–6 pairs, opposite, oblong-elliptic, about 15 cm. long and 6 cm. broad, with about 8–9 pairs of prominent looped lateral nerves ; flowers not seen ; fruits oblong-ellipsoid, about 3 cm. long 2. *deliciosa*

Leaflets very shortly acuminate :

Panicles as long as or longer than the leaves, glabrous ; leaflets 2–3 pairs and an odd one, oblong-elliptic, up to 17 cm. long and 8 cm. broad, glabrous ; calyx cupular, hardly toothed, glabrous ; petals valvate, glabrous ; fruits ellipsoid, 1–1·4 cm. long, glabrous, with a short subapical persistent style .. .. 3. *juglandifolia*

Panicles much shorter than the leaves, glabrous or slightly puberulous ; leaflets 2 pairs and an odd one, oblong-elliptic, slightly pointed, rounded at the base, 5–8 cm. long, 2–4 cm. broad, glabrous and rather finely reticulate ; calyx cupular, with 5 rounded lobes ; petals imbricate, glabrous ; fruits ovoid, shining, glabrous, tipped by the apical short style .. .. 4. *Warneckei*

1. **Sorindeia longifolia** *Oliv.*—F.T.A. 1 : 442. *Trichoscypha longifolia* Engl. A tall glabrous tree with panicles of small flowers from the older wood.
Sierra Leone ! Exsicc.—*T. Vogel* 160.

2. **S. deliciosa** *A. Chev.* Bot. 160, name only.
Ivory Coast : various localities ! S. Nigeria ! Exsicc.—*Chev.* 22683. *Thompson* 9. (See Appendix).

3. **S. juglandifolia** *Planch.*—F.T.A. 1 : 440 ; Chev. Bot. 160. *S. grandifolia* Engl. ? A glabrous tree up to 50 ft. high, with white or reddish flowers, the trunk often with aerial roots.

From Senegal to Dahomey and in the island of St. Thomas. Exsicc.—*Sc. Elliot* 4311; 4476; 4731; 5404; 5546. *Dalz.* 1012. *Chev.* 23455. (See Appendix).

4. **Sorindeia Warneckei** *Engl.* Bot. Jahrb. 36 : 221; Chev. Bot. 161. *S. Schroederi* Engl. & Krause. A glabrous shrub, usually scandent, with small pinkish flowers crowded in short panicles and smooth yellow fruit nearly ¼ in. long.
Gold Coast: Juaso (fr. Aug.)! Togo: Lome (fl. & fr. Feb.)! Ho! Dahomey: Kotonu (July). S. Nigeria: Ikoyi (Jan., Apr.)! Lagos Colony! Exsicc.—*Millson. Dalz.* 1066; 1230. *Irvine* 275. *Warnecke* 52. (See Appendix).

Imperfectly known species.

S. Afzelii *Engl.* Bot. Jahrb. 54 : 313. A glabrous shrub.
Sierra Leone. Exsicc.—*Afzelius.*

3. TRICHOSCYPHA Hook. f.—F.T.A. 1 : 444.

Branchlets and rhachis of the leaves more or less hirsute; inflorescences very short and dense; flowers about 3–5 mm. long:
Leaflets long-pilose on the midrib below, very elongate-oblong, acutely acuminate, rounded at the base, about 30 cm. long and 6·5 cm. broad, reddish-brown below when dry, with about 20 pairs of lateral nerves and very few lax tertiary nerves; axis of inflorescence densely bristly hirsute .. .. .. 1. *atropurpurea*
Leaflets glabrous or nearly so below, oblong-elliptic, usually gradually acuminate, rounded at the base, up to 25 cm. long and 8 cm. broad, dull brown when dry, with up to 12 pairs of lateral nerves; axis of inflorescence shortly hirsute; fruits ovoid, beaked, about 2 cm. long and 1 cm. diam., nearly glabrous .. .. 2. *Mannii*
Branchlets and rhachis of leaves glabrous or slightly pubescent; inflorescence usually long, with very small flowers:
Axis of inflorescence glabrous or slightly pubescent:
Inflorescence very slender and more or less pendulous and lax-flowered; leaflets 3–4 pairs, oblong to elliptic-obovate, abruptly and obtusely acuminate, cuneate at the base, 10–17 cm. long, 5–6 cm. broad, with about 8 pairs of lateral nerves, glabrous below:
Flowers subsessile .. .. 3. *Victoriae*
Flowers on slender pedicels about 3–5 mm. long .. .. .. 4. *Talbotii*
Inflorescence stoutish, stiff and erect, dense-flowered; leaflets lanceolate to oblong-elliptic, up to 20 cm. long and 7 cm. broad, subabruptly acuminate, shortly cuneate at the base, with 8–10 pairs of obscure lateral nerves, glabrous below; fruits obovoid, about 2·5 cm. long, glabrous .. .. 5. *arborea*
Axis of inflorescence more or less rusty-tomentose:
Leaflets about 5 pairs, elongate-oblong:
Inflorescence long, about as long as the leaves, very loosely branched, densely pilose; leaflets oblong, gradually acuminate, shortly cuneate at the base, about 20 cm. long and 6 cm. broad, very densely villous on the midrib above, slightly pubescent below .. .. 6. *Smythei*
Inflorescence much shorter than the leaves, more densely branched, and more or less pyramidal, with shorter indumentum:
Leaflets variable, more or less oblong or oblong-elliptic, abruptly acuminate, rounded or shortly cuneate at the base, up to about 30 cm. long and 9 cm. broad, sometimes hirsute on the midrib above, glabrous below, with numerous lateral nerves .. .. 7. *ferruginea*
Leaflets elongate-oblong, caudate-acuminate, shortly cuneate at the base, 15–23 cm. long, 6–7·5 cm. broad, shortly pubescent on the midrib below, with about 10 pairs of lateral nerves, laxly reticulate below; inflorescence short, pyramidal, 10 cm. long, dense; flowers large, about 5 mm. long; rhachis covered with purple-brown hairs .. .. 8. *longipetala*
Leaflets 2–3 pairs, shortly oblong-elliptic or obovate, abruptly acuminate:
Axis of inflorescence hirsute with one kind of indumentum; leaflets obovate-elliptic, long-acuminate, up to 18 cm. long and 6·5 cm. broad, with 5–8 pairs of lateral nerves prominent below .. .. 9. *bijuga*
Axis of inflorescence with two kinds of hairs: short ones and reflexed longer ones; leaflets very similar to preceding but more oblong-elliptic .. 10. *camerunensis*

1. **Trichoscypha atropurpurea** *Engl.* Bot. Jahrb. 36 : 222. A shrub 10 ft. high.
Liberia: Grand Bassa, Fishtown (Oct.)! Begwai Bush (Sept.)! Exsicc.—*Dinklage* 2082. *Bunting* 135.

2. **T. Mannii** *Hook. f.*—F.T.A. 1 : 444. A shrub or small tree 15 ft. high. *T. Mannii* var. *eketensis* Bak. f.
S. Nigeria: Calabar (Feb.). Oban! Eket! Also in Gabon. Exsicc.—*Mann* 2238. *Talb.* 208T; 1278.

3. **T. Victoriae** *Engl.* Bot. Jahrb. 36 : 224. *T. paniculata* Engl. A glabrous shrub.
S. Nigeria: Oban! Victoria (Mar.)! Also in French Cameroons. Exsicc.—*Talb.* 1725; 1737; 1738. *Preuss* 1206.

4. **T. Talbotii** *Bak. f.* in Cat. Talb. Nig. Pl. 22. Like the last.
S. Nigeria: Oban! Also in French Cameroons. Exsicc.—*Talb.* 579.

5. **T. arborea** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8d : 151; Bot. 161. *Emiliomarcelia arborea* A. Chev. A tree up to 90 ft. high, exuding resin, the inflorescence up to 1 ft. long.
Sierra Leone: Bo! Ivory Coast: Yapo (fr. Oct.)! Gold Coast: Amokokrom (Aug.)! Exsicc.—*Lane-Poole* 467. *Chev.* B 22322. *Chipp* 318.

6. **T. Smythei** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, 1ned.
Sierra Leone: Picket Hill (Dec.)! Exsicc.—*Unwin & Smythe* 33.

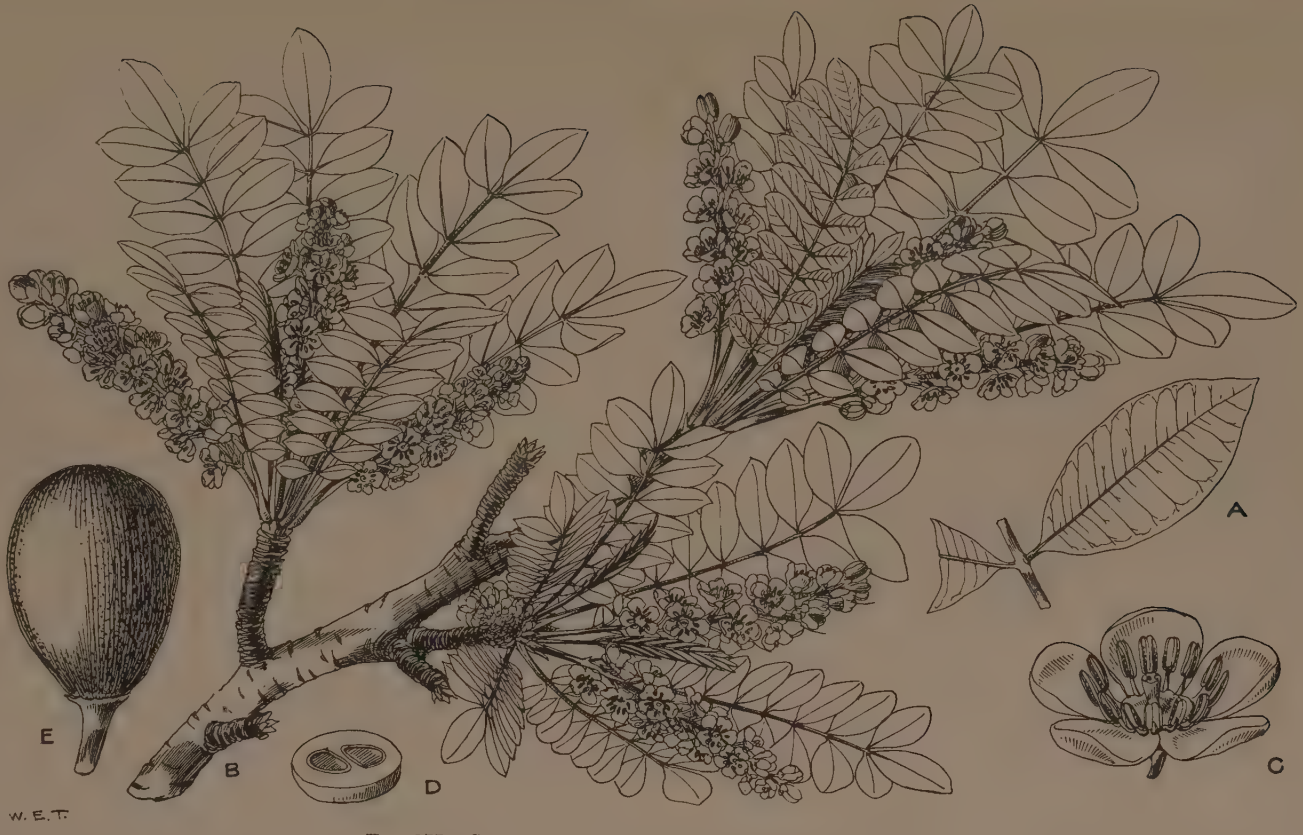

FIG. 177.—SCLEROCARYA BIRREA *Hochst.* (ANACARDIACEAE).
A, leaflet showing venation. B, habit. C, flower. D, cross section of ovary. E, fruit.

7. **Trichoscypha ferruginea** *Engl.* Bot. Jahrb. 15 : 112. *T. albiflora*, *T. Braunii*, *T. liberica*, *T. Preussii*, Engl. A small unbranched tree or a shrub, with dark brown-hairy branchlets and inflorescence; the fruits are leathery-skinned drupes, often red-purple in colour and roughly pubescent.
Liberia: Monrovia. S. Nigeria: Lagos Colony! Ikoyi Plains (Jan., Apr., May, Oct.)! Oban! Aguku! Victoria! Barombi! Also in French Cameroons and Gabon. Exsicc.—*Barter* 2151. *MacGregor* 317. *Talb.* 87; 1301; 1303. *Millen* 93. *Dalz.* 1229. *Preuss* 463; 2836. (See Appendix).

8. **T. longipetala** *Bak. f.* in Cat. Talb. Nig. Pl. 22. A small tree.
S. Nigeria: Oban! Exsicc.—*Talb.* 1681.

9. **T. bijuga** *Engl.* Bot. Jahrb. 1 : 425. A shrub 12–15 ft. high, with rusty-pilose panicles of small flowers ½ as long as the leaves.
Fernando Po (Mar.)! Exsicc.—*Mann* 2343.

10. **T. camerunensis** *Engl.* Bot. Jahrb. 15 : 109. A small shrub 2 ft. high, with rusty-pilose branchlets and inflorescence.
S. Nigeria: Barombi (Apr.)! Exsicc.—*Preuss* 99.

4. SCLEROCARYA Hochst.—F.T.A. 1 : 449.

Branchlets stout, scarred; leaves mostly in a bunch at the end, pinnate; leaflets opposite or subopposite, 7–10 pairs, elliptic or obovate, very acute at the apex, shortly cuneate at the base, about 3·5 cm. long and 2 cm. broad, glabrous, sometimes glaucous, with very obscure nerves; flowers dioecious, precocious, the males in short spikes; bracts broadly ovate, with a membranous margin; stamens 12 or more; fruits obovoid, about 3–3·5 cm. long, glaucous .. .. *Birrea*

S. Birrea *Hochst.*—F.T.A. 1 : 449; Chev. Bot. 157. *Spondias Birrea* A. Rich. in Guill. & Perr. Tent. Fl. Seneg. 1 : 152, t. 41. A tree 15–30 ft. high with corrugated stout branchlets and pale foliage; flowers greenish-white or reddish; fruits yellow, thick-skinned, resembling a small mango.
French Sudan: various localities! Senegal: Walo! Kaolak. Togo: Yendi! Dahomey: Atacora Mts. N. Nigeria: common in the drier regions; Sokoto (Mar.)! Katagum! Extends to Nile Land. Exsicc.—*Chev.* 1207. *Heudelot. Dalz. Gilman* 3. (See Appendix).

5. PSEUDOSPONDIAS Engl. in DC. Monogr. Phan. 4 : 258 (1883).

Branchlets glabrous; leaves pinnate; leaflets 2–6 pairs, alternate or subopposite, oblong or elliptic, broadly and obtusely acuminate, rounded and unequal-sided at the base or slightly cuneate, up to 20 cm. long and 10 cm. broad, glabrous; petiolules 0·5–1 cm. long; flowers very small, polygamous, in lax panicles; sepals 4; petals imbricate; stamens 8–10; fruits 4-celled, broadly ellipsoid, 2 cm. long, mucronate with the persistent style .. .. *microcarpa*

P. microcarpa *Engl.* l.c. 259; Chev. Bot. 157. *P. luxurians* A. Chev. *Spondias microcarpa* A. Rich. in Guill. & Perr. Tent. Fl. Seneg. 1 : 151, t. 40; F.T.A. 1 : 448. A tree up to about 100 ft., with buttressed trunk and panicles of small white flowers; fruit red when ripe.
Throughout the area and extends to E. Africa, south to Nyasa and Angola. (See Appendix).

6. LANNEA A. Rich.—F.T.A. 1 : 445, as *Odina* Roxb.

Leaflets glabrous below except sometimes on the nerves:
Inflorescences unbranched, crowded in a cluster:
Axis of inflorescences glabrous, glaucous; inflorescences clustered, about 15 cm. long; pedicels jointed at the top, persistent, 3 mm. long; leaflets 2–4 pairs, oblong-lanceolate, obtusely acuminate, 8 cm. long, 2–3 cm. broad, the terminal one long-stalked, glabrous; fruits ovoid, about 6 mm. long .. .. .. 1. *Afzelii*
Axis of inflorescences more or less stellate-pubescent:
Leaflets stalked, about 5 pairs, ovate or ovate-lanceolate, broadly and obtusely pointed, shortly cuneate and unequal-sided at the base, 8–12 cm. long, 2·5–5 cm. broad, glabrous except sometimes on the nerves below; petiolules 3–4 mm. long; fruits ellipsoid, 1·3 cm. long, with short styles on the shoulders .. 2. *acida*
Leaflets sessile, about 5–7 pairs, opposite, rounded at the base, lanceolate, obtuse, 4–7 cm. long, 1·5–2·8 cm. broad, nearly glabrous, the terminal leaflet sessile; racemes about 9 cm. long, puberulous; flowers clustered; petals minutely ciliate 3. *fruticosa*
Inflorescences branched, not crowded, stellate-tomentellous, about ½ as long as the leaves; leaflets 2 pairs and an odd one, broadly elliptic to obovate, caudate-acuminate, 12–15 cm. long, 6–7 cm. broad, glabrous; terminal leaflet with a long stalk .. .. 4. *acidissima*
Leaflets tomentose or softly pubescent below with stellate hairs:
Leaflets broadly ovate or ovate-elliptic, about 5 pairs, more or less acuminate, rounded to subcordate at the base, 8–14 cm. long, 4·5–8 cm. broad, softly pubescent mainly on the nerves and veins; rhachis tomentose; racemes unbranched, clustered, stellate-tomentose, up to 15 cm. long; sepals pubescent; fruits 1 cm. long, broadly oblong, oblique at the base, glabrous .. .. 5. *Barteri*
Leaflets oblong, rounded or obtuse at the apex:
Fruits glabrous, 1 cm. long; leaflets 3–4 pairs, opposite, oblong-lanceolate, rounded at each end, softly-tomentose below, about 5 cm. long and 2 cm. broad; inflorescences simple, clustered on the old wood or rarely on the young shoots 6. *velutina*

Fruits white-tomentose, 1·3 cm. long; leaflets about 8 pairs, opposite, oblong, rounded at each end, white-tomentose below, about 2–3 cm. long; inflorescences simple, short; sepals tomentose; petals glabrous .. .. .. 7. *humilis*

1. **Lannea Afzelii** *Engl.* Bot. Jahrb. 24 : 494. *L. Buettneri* Engl. *L. dahomensis* A. Chev. Bot. 159. *L. glaberrima* Engl. A tree up to 30 ft. high, the branchlets glabrous or pilose only when young, flowering before the leaves.
Sierra Leone: Ninia (Feb.)! Buyabuya (Feb.)! Gold Coast: Achimota! Togo: Lome! Misahöhe. Dahomey: Abomey. Zagnanado (Feb.)! Also in French Cameroons. Exsicc.—*Sc. Elliot* 4576; 4916. *Irvine* 189. *Warnecke* 144; A 349. *Chev.* 23039.
2. **L. acida** *A. Rich.* in Guill. & Perr. Tent. Fl. Seneg. 1 : 154; Chev. Bot. 158. *L. djalonica* A. Chev. *L. oleosa* A. Chev. *L. grossularia* A. Chev. *L. microcarpa* Engl. *L. egregia* Engl. *Odina acida* Oliv.—F.T.A. 1 : 446; Stapf 591; Holl. 2 : 177. A tree about 30 ft. high, with nearly glabrous branchlets and girth up to 6–8 ft.; flowers very small, clustered and forming short panicles.
Throughout the area. (See Appendix).
3. **L. fruticosa** *Engl.* in Engl. & Prantl, Pflanzenf. Nachtr. 1 : 213. *Odina fruticosa* Hochst.—F.T.A. 1 : 446. A shrub or small tree with rough lenticellate branchlets, creamy flower-spikes, and leaflets yellowish scurfy below when young.
N. Nigeria: Yola; hills on Bornu Road (July)! Also in Abyssinia and Uganda. Exsicc.—*Dalz.* 173.
4. **L. acidissima** *A. Chev.* in Bull Soc. Bot. Fr. Mém. 8 : 150; Bot. 158. A large tree more or less buttressed at base, glabrous except on the inflorescence; fruits small, black when ripe.
Ivory Coast: various localities! Gold Coast: Adeambra (May)! Exsicc.—*Chev.* 16264 bis; 16319 bis. *Vigne* 862. (See Appendix).
5. **L. Barteri** *Engl.* l.c. 213; Chev. Bot. 158. *Odina Barteri* Oliv.—F.T.A. 1 : 446. A tree 30–40 ft. high, yellowish-tomentose on leaves and branchlets; flowers small, yellow, appearing when leafless.
Ivory Coast: Upper Sassandra! Comoé Valley (Dec.)! Dahomey: Allada; Guillimaro. N. Nigeria: Nupe! Yola and all over N. Nigeria (Apr.)! Agaie! Katagum! S. Nigeria: Lagos Colony! Exsicc.—*Chev.* 21492; 22546. *Barter* 1109. *Dalz.* 178; 225. *Yates* 61. (See Appendix).
6. **L. velutina** *A. Rich.* in Guill. & Perr. Tent. Fl. Seneg. 1 : 154, t. 42; Chev. Bot. 159. *L. Kerstingii* Engl. *Odina velutina* Oliv.—F.T.A. 1 : 447.
Senegal! Gambia: Albreda. French Guinea: Kollangui (Mar.). Timbo (Mar.). Longuery (Dec.). Togo: Sokode. Exsicc.—*Heudelot* 992. *Boivin. Chev.* 12225; 12498 bis; 12871; 13577; 14830. *Kersting* 68a.
7. **L. humilis** *Engl.* l.c. 213. *Odina humilis* Oliv.—F.T.A. 1 : 447. A shrub or small much-branched tree, with hoary white flower-spikes and lower leaf-surface.
N. Nigeria: Yola Prov., Bornu Road (Aug.)! N. Bornu (Apr.)! Extends to E. Sudan. Exsicc.—*E. Vogel* 78. *Dalz.* 170.

7. HAEMATOSTAPHIS Hook. f.—F.T.A. 1 : 443.

Branchlets purplish-glaucous; leaves pinnate; leaflets alternate, about 9–12 on each side, oblong or oblong-elliptic, slightly emarginate at the apex, rounded at the base or slightly cuneate, thin, 5–8 cm. long, 1·5–3 cm. broad, the end one broader, glabrous; petiolules 4–5 mm. long; flowers dioecious, the males very small, in slender lax panicles clustered at the ends of the shoots; male calyx 3-lobed; petals 3, imbricate, about 2 mm. long; stamens 6; female: ovary glabrous, surrounded by small staminodes; fruit drupaceous, broadly ellipsoid, about 2 cm. long .. *Barteri*

H. Barteri *Hook. f.*—F.T.A. 1 : 443; Holl. 2 : 177; Chev. Bot. 159. A small tree with rather glaucous foliage, leaves and pendulous panicles of creamy flowers crowded at the end of the branchlets; fruits plum-like, smooth, deep red.
Gold Coast: Taningnah (fr. Mar.)! Togo: Tamberma (May)! Sokode-Basari! Dahomey: Atacora Mts.! N. Nigeria: Nupe! Randa! Yola (Jan.)! Exsicc.—*McLeod* 840. *Kersting* A. 340. *Kersting* A. 560. *Chev.* 24216. *Barter* 1114; 1341. *Hepburn* 63. *Dalz.* 187. (See Appendix).

8. SPONDIAS Linn.—F.T.A. 1 : 447.

Branchlets glabrous; leaves pinnate with an odd terminal leaflet; leaflets 5–8 pairs, opposite, oblong or oblong-lanceolate, obtusely and broadly acuminate, very unequal-sided at the base, 5–10 cm. long, 2–5 cm. broad, glabrous; flowers small, polygamous, in lax terminal panicles; pedicels 3 mm. long, glabrous; sepals very small; petals valvate, oblong-elliptic, 2·5 mm. long; stamens 8–10, filaments slender; fruit ovoid, 3–3·5 cm. long, wrinkled when dry .. .. *monbin*

S. monbin *Linn.* Sp. Pl. 371. *S. lutea* Linn.—F.T.A. 1 : 448; Stapf 591; Holl. 2 : 177; Chev. Bot. 156. A deciduous tree with large panicles of very small white flowers and yellow plum-like fruit.
Throughout the area and in West Indies and tropical America. (See Appendix).

9. ANTROCARYON Pierre in Bull. Soc. Linn. Par. 1 : 23 (1898).

Leaflets about 6 pairs, opposite, oblong, gradually acuminate, rounded and unequal-sided at the base, 10–14 cm. long, 2·5–4·5 cm. broad, glabrous, with about 10 pairs of rather distant faint lateral nerves; flowers polygamous, small, in puberulous panicles; calyx very small, lobed; petals valvate, pubescent; stamens about 10; ovary 5-celled, styles short, divergent; fruit depressed, 5–6-lobulate, 2·5 cm. diam., glabrous 1. *Klaineanum*

Leaflets 9–10 pairs, more or less as above, but with numerous close parallel nerves shortly pubescent below; flowers not seen .. .. 2. *Micraster*

1. **A. Klaineanum** *Pierre* l.c. 24. A large timber tree with stout somewhat angled branchlets, inflorescence 6–9 in. long, and drupaceous fruits.
Fernando Po: Bokoko. Also in Gabon. Exsicc.—*Mildbraed.* (See Appendix).
2. **A. Micraster** *A. Chev. & Guillaumin* in Bull. Soc. Bot. Fr. Mém. 8 : 152; Chev. Bot. 162. A large timber tree like the last.
Ivory Coast: between Yaou and Ahlamé (Mar.). Agboville (Nov.)! Exsicc.—*Chev.* 17810; B 22336. (See Appendix).

10. RHUS Linn.—F.T.A. 1 : 436, partly.

Leaflets tomentose or pubescent below :

Leaflets obtusely pointed at the apex, entire, obovate, 3–5 cm. long, 1·5–2 cm. broad, softly tomentose below ; inflorescence about as long as the leaf or slightly longer ; fruits globose, about 5 mm. diam., glabrous .. .. 1. *incana*

Leaflets broadly rounded or emarginate at the apex, obscurely crenulate in the upper part, about 1·5–2·5 cm. long, thinly pubescent below .. 1. *incana* var. *dahomensis*

Leaflets glabrous below, entire or slightly crenate, obovate, obtuse or subacute at the apex, 3–5 cm. long, about 2·5 cm. broad, venose ; inflorescences longer than the leaves ; fruits globose, shining, about 6 mm. diam, glabrous .. 2. *glaucescens*

1. **Rhus incana** *Mill.* Gard. Dict. ed. 8, No. 8. *R. villosa* Linn. *f.*—F.T.A. 1 : 439 ; Chev. Bot. 162. *Schmidelia affinis* Chev. Bot. 149 (in part at least). A shrub with yellowish-tomentose branchlets and leaves, occasionally with axillary spines.
French Sudan : Gourma. Senegal : moist places near Kounoun, Cape Verde (Mar.-Apr.) ! French Guinea : Labé (fr. Mar.) ! Common all over tropical Africa and S. Africa ; very variable. Exsicc.—*Döllinger. Chev.* 12404.
var. **dahomensis** *Hutch. & J. M. Dalz.*
Dahomey : between Kouandé and Konkobiri ! Exsicc.—*Chev.* 24263.
2. **R. glaucescens** *A. Rich.*—F.T.A. 1 : 437. A nearly glabrous shrub 8–10 ft. high, with minute greenish flowers and pale green leaves.
N. Nigeria : Naraguta (Nov.) ! Extends to E. and S.E. Tropical Africa. Exsicc.—*Lely* 718.

11. HEERIA Meisn. Gen. Comm. 55 (1837).

Leaves acute and mucronate, lanceolate to oblong-lanceolate, up to 15 cm. long and 3·5 cm. broad, closely silky-tomentellous below and glaucous, with very numerous spreading parallel lateral nerves ; inflorescences forming a terminal leafy narrowly pyramidal panicle ; fruits subdidymous, black, about 1 cm. broad .. 1. *insignis*

Leaves obovate-elliptic or broadly elliptic, subtruncate or emarginate at the apex, sometimes mucronate, cuneate at the base, up to 20 cm. long and 7 cm. broad, greenish below, softly tomentose, with numerous parallel lateral nerves ; inflorescence a lax oblong leafy panicle ; fruits as above .. .. 2. *pulcherrima*

1. **H. insignis** *O. Ktze.* Rev. Gen. 152. *Rhus insignis* Del.—F.T.A. 1 : 437 ; Holl. 1 : 168 ; Chev. Bot. 161. *R. insignis* vars. *lanceolata* and *latifolia* Engl. A shrub or small spreading tree 15 ft. high, with leaves silvery white below.
French Sudan : Ségou (Sept.) ! Senegal : Mbidjem ! Gambia ! Dahomey : Atacora Mts. ! N. Nigeria : Kontagora ! Nupe ! Extends to Abyssinia and Congo. Exsicc.—*Chev.* 3037 ; 24027. ; *Sieber* 33. *Heudelot* 67. *Dawe* 38. *Dalz.* 101. *Barter* 904. (See Appendix).
2. **H. pulcherrima** *O. Ktze.* l.c. *Rhus pulcherrima* Oliv.—F.T.A. 1 : 436 ; Chev. Bot. 162. *R. herbacea* and *R. djalonensis* A. Chev. Bot. 161. A shrub or small tree with milky juice, softly pubescent branchlets, etc., small whitish or reddish flowers and flattened fruits.
French Sudan : Banbara. French Guinea : Timbo, Kollangui. Sierra Leone : along the Niger (Mar.) ! Dahomey : between Kouandé and Konkobiri ! N. Nigeria : between Hepham and Ropp. Naraguta ! Katagum ! Abinsi. Extends to E. and S.E. Africa. Exsicc.—*Sc. Elliot* 5167. *Chev.* 24243. *Lely* 71 ; 351. *Dalz.* 353 ; 775. (See Appendix).

12. MANGIFERA Linn.—F.T.A. 1 : 442.

Branchlets glabrous ; leaves oblong-lanceolate, acutely acuminate, cuneate at the base, 10–25 cm. long, 3–4·5 cm. broad, glabrous, closely reticulate on both surfaces, with numerous spreading looped lateral nerves ; petiole 2–4 cm. long ; flowers small, polygamous or dioecious, in terminal pyramidal panicles nearly as long as the leaves ; pedicels and sepals pubescent ; petals glabrous ; fruit obliquely ovoid, up to 15 cm. long, with a leathery rind and fibrous stone .. .. *indica*

M. indica *Linn.*—F.T.A. 1 : 442 ; Holl. 1 : 169 ; Chev. Bot. 155.
Senegal : Thiès (Nov.). Casamance (Jan.). Gambia ! French Guinea : Nono and Konakry, etc. (Feb.). Sierra Leone : Mahera (Dec.) ! Freetown (Dec.) ! Gold Coast : Kumasi ! Togo : Lome ! The Common Mango, widely cultivated but here and there well established in secondary bush. Exsicc.—*Pirie* 39. *Sc. Elliot* 4036. *Deighton* 500. *Cummins* 76. *Warnecke* 481c. (See Appendix).

13. ANACARDIUM Rottb.—F.T.A. 1 : 443.

Branchlets angular, glabrous ; leaves simple, obovate or oblong-obovate, rounded or truncate at the apex, cuneate at the base, 8–15 cm. long, 5–10 cm. broad, papery, glabrous, closely reticulate, with 10–15 pairs of spreading lateral nerves prominent below ; petiole up to 2 cm. long, flat above ; flowers polygamous in lax terminal panicles ; bracts large, enfolding the flowers, ovate, acuminate, softly puberulous ; petals 5, linear ; stamens 10, usually only some bearing anthers ; fruit a kidney-shaped nut supported by a large pear-shaped enlarged receptacle and stalk *occidentale*

A. occidentale *Linn.*—F.T.A. 1 : 443 ; Holl. 1 : 175 ; Chev. Bot. 156. The Cashew tree, commonly naturalised in the bush, chiefly in the coastal districts.
French Sudan : Sareya (Feb.) ! Senegal : Casamance ! French Guinea : Konakry. Sierra Leone ! Ivory Coast ! Dahomey ! S. Nigeria : Johann-Albrechtshöhe ! Fernando Po ! Also in East Africa and Angola. Native of tropical America, cultivated generally in the tropics. Exsicc.—*Chev.* 450 bis. *Sc. Elliot* 3992 ; 5848. *Staudt* 649. *Vogel* 82. (See Appendix).

14. FEGIMANRA Pierre ex Engl. in Engl. & Prantl, Pflanzenf. 3, 5 : 458 (1896).

Leaves obovate-elliptic, rounded at the apex, shortly narrowed into the petiole at the base, 10–15 cm. long, 5–8 cm. broad, rigid, the midrib and about 10 pairs of lateral nerves nearly equally prominent on both surfaces, shining above, glabrous ; petiole subterete, 2·5 cm. long ; panicle terminal, very ample, with rather long lateral branchlets with small cymules of flowers at the ends ; bracts very small, caducous ; bracteoles small, ovate, puberulous ; sepals broadly semiorbicular ; petals puberulous ; stamen 1 .. .. *Afzelii*

F. Afzelii *Engl.* Bot. Jahrb. 36 : 214. A glabrous tree.
Sierra Leone. French Guinea ! Exsicc.—*Afzelius* (not seen). *Farmar* 314.

109. CONNARACEAE

With G. Schellenberg [1]

Erect trees or shrubs, or scandent. Leaves alternate, compound, imparipinnate or 1–3-foliolate ; stipules absent. Flowers hermaphrodite, actinomorphic or slightly zygomorphic. Calyx imbricate or valvate. Petals 5, free or sometimes slightly connate, imbricate or rarely valvate. Stamens hypogynous to perigynous, often declinate, 5 or 10 ; filaments often united at the base ; anthers 2-celled, opening lengthwise. Disk absent or thin. Carpels 1–5, free, 1-celled. Ovules 2, collateral, erect, attached near the base or the middle of the ventral suture, all or only 1 ripening into fruit. Fruit often splitting down one side exposing the seed. Seeds usually 1, with or without endosperm, often arillate.

A small tropical family easily recognised by the pinnate or unifoliolate exstipulate leaves, apocarpous ovary and arillate seeds.

Carpels 5 :
Sepals free to the base :
Androgynophore absent from the flower :
Petals very long, loriform, spirally coiled in bud ; calyx enlarged in fruit :
Sepals in fruit thin and enlarged ; leaflets in numerous pairs, oblique, the lowermost stipule-like ; fruits glabrous, with a curved beak .. 1. **Roureopsis**
Sepals in fruit leathery ; leaflets few ; only 1 carpel fruitful .. .. 2. **Paxia**
Petals not loriform, mostly obtuse at the apex :
Flowers appearing before the leaves ; only 1 carpel fruitful ; seeds with a fleshy outer covering .. .. 3. **Byrsocarpus**
Flowers appearing after the leaves :
Inflorescence terminal or nearly terminal, never on the older wood :
Petals about ¼ as long as the sepals ; seeds with endosperm and a basal aril ; sepals not enlarged in fruit ; several carpels fruitful .. .. 4. **Cnestis**
Petals as long as or longer than the sepals :
Leaves trifoliolate ; hairs stellate ; sepals with glands on the margin, not enlarged in fruit ; seeds without endosperm ; several carpels fruitful 5. **Agelaea**
Leaves pinnate ; hairs simple ; sepals without glands ; sepals enlarged in fruit ; aril completely adnate to the seed .. .. .. 6. **Jaundea**
Inflorescences axillary or clustered on the old wood :
Leaves trifoliolate, pitted on the upper surface (sunken mucilage cells) ; seeds without endosperm ; sepals not enlarged in fruit .. .. 7. **Castanola**
Leaves pinnate, rarely 3- or 1-foliolate, not pitted :
Inflorescence few-flowered (about 3–5) ; seed with a fleshy outside layer ; fruit rounded at the top .. .. 3. **Byrsocarpus**
Inflorescence several- to many-flowered :
Sepals imbricate, glabrous or nearly so ; inflorescences not clustered ; only 1 carpel fruitful ; aril enveloping the seed but free from the testa 8. **Santaloides**
Sepals nearly valvate, tomentose ; inflorescences often clustered on the older branches .. .. 4. **Cnestis**
Androgynophore present ; leaflets striolate between the veins ; sepals not enlarged in fruit .. .. 9. **Manotes**
Sepals connate, enlarged in fruit ; fruits tomentose .. .. 10. **Spiropetalum**

[1] We are much indebted to Dr. G. Schellenberg, of Göttingen, for an abstract of his recent work on this family for Engler's Pflanzenreich.

Carpel solitary :
Flowers borne on the young growths :
Leaflets several to each leaf ; fertile stamens 10 or 5 ; seed without endosperm
11. **Connarus**
Leaflet solitary ; fertile stamens 5 ; seed with hard bony endosperm
12. **Hemandradenia**
Flowers in clusters on the older wood ; fruits 2-seeded ; leaves large and pinnate
13. **Jollydora**

1. ROUREOPSIS Planch. in Linnaea 23 : 423.

Leaflets numerous, obliquely oblong, mucronate, 2·5–6 cm. long, 1 ·2 cm. broad, pubescent on the midrib below, with 1–2 basal nerves on one side, the basal leaflets smaller and stipule-like ; flowers in sessile clusters on very long inflorescences ; fruits 1·5 cm. long, with a curved beak .. .. *obliquifoliolata*

R. obliquifoliolata *Schellenb.* Beitr. 28. *Rourea obliquifoliolata* Gilg. *Rourea fasciculata* Gilg. *Rourea adianthoides* Gilg. A climbing shrub with brown-pubescent branchlets ; flowers dull yellow ; fruit red, splitting to expose a black seed with an aril.
S. Nigeria : Oban ! Extends to Angola. Exsicc.—*Talb.* 504.

2. PAXIA Gilg in Engl. Bot. Jahrb. 14 : 320 (1891).

Midrib of leaflets glabrous below ; leaflets elliptic-obovate, gradually acuminate, 8–12 cm. long, 3–6 cm. broad, with 4–5 pairs of lateral nerves ; cymes axillary, very short and fasciculate, puberulous ; petals about 1·5 cm. long .. .. 1. *liberosepala*
Midrib of leaflets puberulous below ; leaflets ovate or ovate-lanceolate, obtusely acuminate, 5–10 cm. long, 2·5–4 cm. broad, leathery, with 6–7 pairs of lateral nerves ; cymes few-flowered, fasciculate ; fruits 2·5–3 cm. long .. .. 2. *cinnabarina*

1. **P. liberosepala** *Schellenb.* ms. *Spiropetalum liberosepalum* Bak. f. A glabrous climbing shrub with dull yellow flowers.
S. Nigeria : Oban ! Exsicc.—*Talb.* 575 ; 1404a.
2. **P. cinnabarina** *Schellenb.* in Engl. Bot. Jahrb. 55 : 449. A climbing shrub ; branchlets rusty-yellow when young ; fruit cinnabar-red.
S. Nigeria : Eket ! Victoria ! Also in French Cameroons. Exsicc.—*Winkler* 526. *Talb.* 3352.

3. BYRSOCARPUS Schum. & Thonn. Beskr. Guin. Pl. 226 (1827).

Leaflets numerous, small, oblong, rounded at the apex, the lateral ones oblique, very flaccid when young, the older ones firmer and about 2 cm. long, emarginate ; flowers few, axillary, subfasciculate ; pedicels slender, glabrous ; calyx ciliate ; fruits oblong, 1·5 cm. long, glabrous .. .. 1. *coccineus*
Leaflets few, larger, acuminate :
Leaf-rhachis slender ; inflorescence fairly long ; bracts small, subulate ; sepals not bearded at the apex ; pedicels very slender, 1·5-2·5 cm. long, jointed in the middle ; leaflets rhomboid-elliptic, gradually acuminate, cuneate at the base, 4·7 cm. long, up to 4·5 cm. broad ; fruits 1·5 cm. long, contracted about the middle
2. *Dinklagei*
Leaf-rhachis stout ; inflorescence short and fasciculate ; bracts conspicuous ; sepals bearded ; leaflets broadly elliptic to obovate, long-caudate-acuminate, rounded at the base, 5–12 cm. long, 3–7 cm. broad, green and glabrous ; fruit oblong, 2 cm. long
3. *viridis*

1. **B. coccineus** *Schum. & Thonn.* Beskr. Guin. Pl. 226 ; F.T.A. 1 : 452 ; Stapf 592 ; Holl. 2 : 178 ; Chev. Bot. 163. *B. puniceus* Schum. & Thonn. *Rourea coccinea* Benth. *B. parvifolius* Planch. *B. parviflorus* Planch. *B. coccineus* var. *parvifolius* Bak.—F.T.A. 1 : 452. *Rourea inodora* De Wild. A small shrub with white flowers and bright scarlet fruits (sometimes yellow when ripe in the northern regions).
Common throughout the area, extending to Angola and E. Africa. (See Appendix).
2. **B. Dinklagei** *Schellenb.* ms. *Rourea Dinklagei* Gilg. *R. Laurentii* De Wild. *R. ealaensis* De Wild. *R. coriacea* De Wild. Climbing shrub 12 ft. high ; calyx green ; corolla white ; fruit red.
S. Nigeria : Calabar (Apr.) ! Cameroons River ! Fernando Po ! Exsicc.—*Holland* 25 ; 67. *Mann* 279 ; 756.
3. **B. viridis** *Schellenb.* Beitr. 46. *Rourea viridis* Gilg. *R. unifoliolata* Gilg. *R. Mannii* Gilg. *R. pallens* Hiern. A shrub with white flowers.
S. Nigeria : Onitsha ! Oban ! Calabar ! Degema ! Extends south to Gabon and Congo. Exsicc.—*Barter* 1634. *Talb.* 1629 ; 3794. *Thomas* 780. *Thomson* 52.

4. CNESTIS Juss.—F.T.A. 1 : 460.

Fruits pear-shaped, not horn-shaped at the top, covered with short velvety hairs :
Petals ½ as long as the sepals :
Leaflets numerous, more than 6 pairs :
Flowers small, 2–3 mm. long ; inflorescences shorter than the leaves, clustered at the ends of the shoots ; leaflets obtusely pointed, oblong, rounded at the base, about 5–7 cm. long and 2 cm. broad, softly pubescent below ; fruits bluntly beaked, about 3–4 cm. long, hairy inside .. .. .. 1. *ferruginea*
Flowers larger, about 7 mm. long ; inflorescences as long as the leaves ; leaflets blunt at the apex, narrowly oblong, about 4 cm. long and 1·5 cm. broad, thinly pilose below ; fruits elongate, 5–6 cm. long, gradually beaked 2. *macrantha*

Leaflets few, up to 4 pairs, broadly ovate-elliptic, abruptly acuminate at the apex, rounded at the base, 11–20 cm. long, 6–12 cm. broad, very shortly pubescent below; inflorescence laxly branched .. .. 3. *Mannii*

Petals as long as or slightly longer than the sepals; leaflets 2–3 pairs, ovate-elliptic, long-acuminate, rounded at the base, up to 12 cm. long and 5 cm. broad, nearly glabrous below; inflorescences much shorter than the leaves, simply racemose; fruits about 2 cm. long, slightly beaked .. .. 4. *racemosa*

Fruits with a horn-shaped top, covered with a short velvet coat of hairs and with long bristles; petals longer than the sepals:

Leaflets glabrous below except on the midrib and margins, few pairs, ovate, subacute, up to 8 5 cm. long and 4 cm. broad; inflorescences short; fruits curved 5. *Dinklagei*

Leaflets not glabrous below:

Leaflets softly pubescent below, about 5 pairs, ovate or broadly oblong-ovate, up to 11 cm. long and 5·5 cm. broad, shortly and broadly acuminate, truncate or subcordate at the base; inflorescences short and densely clustered; fruits curved, with a slender beak, about 3 cm. long.. .. .. 6. *longiflora*

Leaflets with scattered bristles on both surfaces or below:

Leaflets large, about 6 pairs, up to 20 cm. long, broadly oblong, abruptly acuminate, sessile and subcordate, pilose on the nerves and on the rhachis; inflorescences very short, catkin-like; fruits curved almost at a right angle, 3·5 cm. long 7. *grisea*

Leaflets small, numerous, oblong, the basal pair broadly ovate or rounded, about 4 cm. long and 2 cm. broad, shortly acuminate, subcordate at the base, pilose on the midrib and rhachis; inflorescences short and clustered; fruits as in *C. grisea*, about 2·5 cm. long .. .. 8. *corniculata*

1. **Cnestis ferruginea** *DC.*—F.T.A. 1 : 461; Holl. 2 : 179; Chev. Bot. 166. *C. oblongifolia* Bak.—F.T.A. 1 : 462. A shrub, densely-brown pubescent, with conspicuous red velvety fruits and small white flowers. Common throughout the area and extending to Angola. (See Appendix).
2. **C. macrantha** *Baill.*—F.T.A. 1 : 462. A shrub 8–10 ft. high, densely yellowish-hairy.
S. Nigeria: Calabar (Feb.)! Oban! Exsicc.—*Mann* 2235. *Duparquet* 52; 53. *Talb.* 1706; 1279.
3. **C. Mannii** *Schellenb.* in Engl. Bot. Jahrb. 55 : 436. *Connarus Mannii* Bak.—F.T.A. 1 : 459. A climbing shrub 15 ft. high, shortly yellowish-pubescent on branchlets and inflorescence.
S. Nigeria: Calabar! Oban! Johann-Albrechtshöhe! Exsicc.—*Mann* 2264. *Talb.* 1707. *Staudt* 916.
4. **C. racemosa** *Don*—F.T.A. 1 : 463. *Manotes racemosa* Gilg. *Cnestis liberica* Schellenb. A climbing shrub, with shortly brown-pubescent branchlets and inflorescence and pale red fruits.
Sierra Leone: Njala (Jan.)! Heddles Farm! Liberia: Kakatown! Crozierville! Exsicc.—*Afzelius. Whyte. Dalz.* 974; 8105; 8119. *Dinklage* 2449. (See Appendix).
5. **C. Dinklagei** *Schellenb.* in Engl. Bot. Jahrb. 55 : 437. A climbing shrub.
Liberia: Monrovia! Exsicc.—*Dinklage* 2412; 2695; 2712.
6. **C. longiflora** *Schellenb.* in Engl. Bot. Jahrb. 55 : 438. *C. prehensilis* A. Chev. Bot. 167. A woody climber; inflorescences creamy-white, on the stems; fruits scarlet, pungent-bristly.
Ivory Coast: Bouroukrou (Jan.)! Dahomey: Porto Novo (Jan.). S. Nigeria: Lagos Colony! Ikoyi (Nov.)! Exsicc.—*Dalz.* 1155; 1401. *Millen* 115. *Dawodu* 194. *Chev.* 16887; 22828. (See Appendix).
7. **C. grisea** *Bak.*—F.T.A. 1 : 461; Chev. Bot. 167. A woody climber, bristly hairy on most parts; inflorescences clustered on the main branches; fruits scarlet, pungent-bristly.
S. Nigeria: Calabar! Johann-Albrechtshöhe! Extends to Gabon. Exsicc.—*Thomson* 90. *Staudt* 844.
8. **C. corniculata** *Lam.*—F.T.A. 1 : 461; Holl. 2 : 178; Chev. Bot. 166. A woody climber with roughly pilose branchlets, flowers cream-white in short clustered racemes sometimes on the older branches; fruits scarlet, beaked, covered with pungent bristles.
Sierra Leone: various localities! Exsicc.—*Sc. Elliot* 3831. *Smythe* 205. *Dalz.* 1007. *Aylmer* 391. *Thomas* 4340; 4527; 5952; 7921.

5. AGELAEA Soland.—F.T.A. 1 : 453.

Indumentum of inflorescence axis composed of erect mostly 2-armed rather long hairs:

Axis of inflorescence densely villous; pedicels very short, 1–2 mm. long; leaflets obliquely ovate, abruptly acuminate, rounded or broadly cuneate at the base, about 10 cm. long and 5 cm. broad, thinly pubescent below; fruits obliquely obovoid, about 2 cm. long, shortly tomentose .. .. 1. *trifolia*

Axis of inflorescence not densely hairy; pedicels 3–5 mm. long; leaflets as above, but thinly pubescent on the nerves; inflorescence very lax and slender .. 2. *elegans*

Indumentum of inflorescence axis puberulous, not bristly:

Hairs more than 4-rayed:

Leaflets trinerved from the base, ovate, abruptly and acutely acuminate, rounded at the base, the terminal one 4–7·5 cm. long, 2·5–4 cm. broad, leathery, pubescent below .. .. 3. *oligantha*

Leaflets penninerved, elliptic, gradually and acutely acuminate, cuneate at the base, the terminal one 4–6 cm. long and 2·5–3·5 cm. broad, minutely puberulous below; fruits obovoid, 2·5 cm. long, purple-velvety .. ..4. *macrocarpa*

Hairs 4-rayed:

Leaflets broadly ovate, abruptly acuminate, about 7 cm. long and 4 cm. broad, minutely scabrid-puberulous below; inflorescence a stiff leafy panicle; pedicels very short; fruits shortly obovoid, 1 cm. long, tomentellous .. 5. *nitida*

Leaflets obovate, narrowed at the base, abruptly long-acuminate, 12–15 cm. long, 7·5–9 cm. broad, glabrous below; inflorescence a large panicle .. 6. *Preussii*

Leaflets suborbicular or ovate-orbicular, abruptly long-acuminate, about 11 cm. diam., minutely puberulous below; inflorescence a large broad panicle; pedicels very short; fruits narrowly obovoid, 1·5–2 cm. long, velvety-tomentellous
7. *pseudobliqua*

Indumentum absent or nearly so; leaflets ovate to broadly obovate or suborbicular, shortly acuminate, about 9 cm. long and 6 cm. broad, leathery, glabrous below, conspicuously 3-nerved from the base; flowers rather crowded in large panicles; fruits obliquely obovoid, up to 2 cm. long, usually about 1 cm., tomentellous
8. *obliqua*

1. **Agelaea trifolia** *Gilg* in Notizbl. Bot. Gart. Berlin 1 : 65. *Cnestis trifolia* Lam. *Omphalobium villosum* DC. *Agelaea villosa* Soland.—F.T.A. 1 : 454; Chev. Bot. 164. Climber with rusty brown branchlets and inflorescence; flowers creamy white in ample panicles; fruits scarlet.
Senegal! French Guinea: Konakry and Iles de Los. Sierra Leone: various localities! Ivory Coast. Cavally River! S. Nigeria: Oban! Idumuye (Jan.)! Exsicc.—*Heudelot* 730. *Mann* 794. *Barter. Sc. Elliot* 4478. *Dalz.* 1008. *Deighton* 470. *Talb.* 1734. *Thomas* 2168; 2175. (See Appendix).
2. **A. elegans** *Schellenb.* in Engl. Bot. Jahrb. 58 : 213. A climber with pilose branchlets.
S. Nigeria: Degema! Cameroons Mt.: Bodje (Aug.)! Exsicc.—*Talb.* 3670. *Ledermann* 307.
3. **A. oligantha** *Gilg* ex *Schellenb.* Beitr. 1910 : 63 and l.c. 214.
Liberia: Grand Bassa, Fishtown (Aug.)! Exsicc.—*Dinklage* 1711.
4. **A. macrocarpa** *Schellenb.* in Engl. Bot. Jahrb. 58 : 214.
Liberia: Grand Bassa. Fishtown (fr. Oct.)! Exsicc.—*Dinklage* 1866.
5. **A. nitida** *Soland.* ex *Planch.* in Linnaea 23 : 437. A woody climber.
Senegal: Pongo! Sierra Leone: Kanbia! Ivory Coast: Konakry! Exsicc.—*Heudelot* 894. *Sc. Elliot* 4224. *Afzelius. Don. Smythe. Debeaux* 321.
6. **A. Preussii** *Gilg* in Engl. Bot. Jahrb. 23 : 210. A woody climber with yellow-brown-tomentose branchlets and inflorescence.
S. Nigeria: between Victoria and Bimbia (May)! Exsicc.—*Preuss* 1116; 1277.
7. **A. pseudobliqua** *Schellenb.* l.c. 216. A shrub 8 ft. high, with scarlet velvety fruits.
S. Nigeria: Cross River! Calabar! Eket! Oban! Fernando Po! Extends to Gabon. Exsicc.—*Holland* 28; 68. *Talb.* 1762. *Mann* 433.
8. **A. obliqua** *Baill.*—F.T.A. 1 : 454; Chev. Bot. 164. *Cnestis obliqua* P. Beauv. Fl. Owar. 1 : 95, t. 59. A scrambling shrub with shining leaves, pure white fragrant flowers and soft scarlet fruits.
Throughout the area as far as S. Nigeria. (See Appendix).

6. JAUNDEA Gilg in Notizbl. Bot. Gart. Berlin 1 : 66 (1895).

Leaflets more or less pilose on the nerves beneath, about 3 pairs, obovate or obovate-elliptic, acutely acuminate, rounded or obtuse at the base, up to 12 cm. long and 7 cm. broad, strongly veined below; panicles shorter than the leaves; calyx puberulous; fruits 2·5 cm. long .. .. 1. *pubescens*

Leaflets glabrous beneath but sometimes hairy on the midrib:

Leaflets lanceolate, gradually long-acuminate, rounded at the base, 5–10 cm. long, 2–2·5 cm. broad, laxly reticulate; fruit obliquely oblong, about 2 cm. long
2. *Baumannii*

Leaflets ovate or oblong-obovate, 3–4 pairs, obtusely pointed and mucronate, up to 12 cm. long and 5 cm. broad, laxly veined below; panicles clustered and short; calyx pubescent outside; fruits 2–3 cm. long .. .. 3. *pinnata*

1. **Jaundea pubescens** *Schellenb.* in Engl. Bot. Jahrb. 55 : 462. *Connarus pubescens* and *C. Thomsoni* Bak.—F.T.A. 1 : 458. *Rourea Buchholzii* Gilg. *R. nivea* Gilg. *Byrsocarpus niveus* Schellenb. *B. Buchholzii* Schellenb. A shrub 15 ft. high with nearly glabrous branchlets.
S. Nigeria: Lagos Colony! Calabar! Extends to French Cameroons. Exsicc.—*Millen* 109. *Mann* 2254. *Thomson* 26.
2. **J. Baumannii** *Schellenb.* in Engl. Bot. Jahrb. 55 : 460. *Rourea Baumannii* Gilg. *Byrsocarpus Baumannii* Schellenb. A lofty climbing shrub.
Togo: Misahöhe (fr. Mar.)! Exsicc.—*Baumann* 31.
3. **J. pinnata** *Schellenb.* in Candollea 2 : 92. *Cnestis pinnata* P. Beauv. Fl. Owar. 1 : 98, t. 60. *Manotes Palisotii* Planch. *Rourea Palisotii* Baill. *R. pseudobaccata* Gilg. *R. venulosa* Hiern. *R. ivorensis* A. Chev. Bot. 165, name only. *Jaundea Zenkeri* Gilg. *Paxia Dewevrei* De Wild. and Th. Dur. *Connarus libericus. Byrsocarpus pseudobaccatus* Schellenb. *Jaundea pseudobaccata* Schellenb. A strong woody climber, or sometimes an erect shrub, glabrous except on the young parts and inflorescence; flowers white or pink-tinged, fragrant.
French Guinea: Futa Jallon, Kouria! Beyla! Ivory Coast: Morénou (Dec.)! Abomey! S. Nigeria: Ala (Nov.)! Exsicc.—*Chev.* 18172; 20847; 22503; 23178. *Thomas* 1980. Extends to Angola.

7. CASTANOLA Llanos in Mem. Acad. Cienc. Madrid 3, 2 : 305 (1859).

Leaflets broadly obovate-elliptic, long and abruptly acuminate, broadly cuneate at the base, 8–16 cm. long, 4–10 cm. broad, glabrous and obscurely reticulate; inflorescence a short panicle; fruit narrowly obovoid, beaked, up to 2 cm. long, tomentellous
paradoxa

C. paradoxa *Schellenb.* ms. *Agelaea paradoxa* Gilg. *Hemiandrina paradoxa* Schellenb. *Agelaea fragrans* Gilg. *A. brevipaniculata* Cummins. A scrambling shrub or small tree with fragrant white flowers.
Gold Coast: Kumasi (Mar.)! Asamankese (July–Aug.)! Akim (June)! S. Nigeria: Oban! Eket! Extends to the Congo. Exsicc.—*Irvine* 127. *Howes* 936. *Johnson* 764. *Cummins* 30A. *Talb.* 1294; 1300. (See Appendix).

8. SANTALOIDES O. Ktze. Rev. Gen. 1 : 155 (1891) (*Santalodes*); Schellenb. in Beitr. 46, 76 and 119.

Leaflets shortly and broadly acuminate, ovate, up to 9 cm. long and 5 cm. broad, usually smaller, prominently reticulate; cymes very slender, glabrous, much shorter than the leaves; sepals glabrous; fruits symmetrically ovoid, acute, glabrous, very closely striate, 1·5–2 cm. long .. .. 1. *gudjuanum*

Leaflets long- and acutely caudate-acuminate, oblong or obovate, 5–10 cm. long, 2–5 cm. broad, glabrous, reticulate; racemes clustered, very short, 6–12-flowered; sepals ciliate; fruits oblong, glabrous, 1·5 cm. long .. .. 2. *Afzelii*

1. **S. gudjuanum** *Schellenb.* in Engl. Bot. Jahrb. 55 : 454. *Rourea gudjuana* Gilg. *R. chiliantha* Gilg. A glabrous shrub or small tree, with small white or pink-tinged flowers and smooth red fruit, not splitting along one side.
French Guinea : Timbo ! Sierra Leone ! Togo : Sokode ! N. Nigeria : Katagum ! Also in N. Cameroons. Exsicc.—*Chev.* 12551 ; 14637. *Sc. Elliot* 5352. *Kersting* A. 94 ; A. 116. *Dalz.* 409. (See Appendix).

2. **S. Afzelii** *Schellenb.* Beitr. 53. *Rourea Afzelii* Planch. *R. santaloides* W. & A.—F.T.A. 1 : 455. A glabrous shrub or tree.
Sierre Leone ! Exsicc.—*Afzelius. Whitfield.*

9. MANOTES Soland.—F.T.A. 1 : 459.

Inflorescences terminal :
Axes of inflorescence tomentose :
Sepals narrow, lanceolate-triangular, about 4 mm. long ; petals linear, about 1·2 cm. long ; leaflets ovate-oblong, up to 7 cm. long and 2·5 cm. broad, pilose below, reticulate above ; fruits beaked, 4 cm. long, wrinkled and tomentellous 1. *longiflora*
Sepals short, broadly triangular ; petals about 5 mm. long ; leaflets oblong or oblong-obovate, rather abruptly and obtusely acuminate, broadly cuneate at the base, up to 6 cm. long, appressed-pilose below, closely reticulate above .. 2. *Zenkeri*
Axes of inflorescence glabrous ; lateral leaflets ovate, terminal obovate, all rather abruptly acuminate, laxly reticulate ; inflorescence long and slender, loose ; sepals lanceolate, 3 mm. long, minutely puberulous ; petals linear, 6–7 mm. long ; fruits stipitate, obliquely obovoid, 1·5 cm. long, softly puberulous .. .. 3. *expansa*
Inflorescences axillary, short ; flowers large ; sepals about 8 mm. long, puberulous ; leaflets large, 8–15 cm. long, 4–6·5 cm. broad, oblong-elliptic, rounded at the base, acuminate, laxly reticulate, with about 7 pairs of looped lateral nerves ; fruits stipitate, obovoid, sharply beaked, 1·5 cm. long, glabrous .. .. 4. *macrantha*

1. **Manotes longiflora** *Bak.*—F.T.A. 1 : 460. A scrambling shrub, with brownish-yellow inflorescence and scarlet-velvety fruit.
Sierra Leone ! Ivory Coast ! Gold Coast : Axim ! Sekondi ! S. Nigeria : Lagos, common (Sept.) ! Epe ! Calabar ! Eket ! Exsicc.—*Sc. Elliot* 4184. *Jolly* 69 ; 144. *Chev.* 16698. *Chipp* 423. *Howes* 973. *Millen* 166 ; 185. *Rowland* 37. *Dalz.* 1023. *Barter* 3283. *Talb.* 3112. *Mann* 2256.

2. **M. Zenkeri** *Gilg* ex *Schellenb.* in Engl. Bot. Jahrb. 55 : 444. Climbing shrub like the last.
S. Nigeria : Bonny River (Oct.) ! Eket ! Calabar ! Also in French Cameroons. Exsicc.—*Mann* 508. *Talb.* 3125.

3. **M. expansa** *Soland.*—F.T.A. 1 : 459 ; Stapf 592 ; Chev. Bot. 166. A climbing shrub, the branchlets lenticellate, brownish-pubescent when young ; inflorescence reddish-yellow ; petals white or pinkish, turning orange-yellow ; fruit reddish.
Sierra Leone : Bagroo R. (Apr.) ! Freetown, common (Dec., Jan.) ! Njala ! Liberia : Grand Bassa (July) ! Kakatown ! Ivory Coast : several localities. Exsicc.—*T. Vogel* 95. *Mann* 859. *Sc. Elliot* 4190. *Whyte. Dalz.* 955 ; 1009.

4. **M. macrantha** *Schellenb.* Beitr. 1910 : 21. *Dinklagea macrantha* Gilg. Shrub or small tree ? with blunt hooks on the branches and smooth, almost coriaceous, leaves ; flowers yellowish ; fruits light brown when dry.
Liberia : Grand Bassa, in woods and bush (fr. July) ! Exsicc.—*Dinklage* 1965.

10. SPIROPETALUM Gilg in Engl. Bot. Jahrb. 14 : 335 (1891).

Midrib of leaflets puberulous or pubescent beneath :
Leaflets not distinctly reticulate on the upper surface, about 3 pairs, oblong to obovate-elliptic, obtusely acuminate, with about 5 pairs of lateral nerves ; flowers in dense axillary clusters ; calyx campanulate, tomentose .. .. .. 1. *Solanderi*
Leaflets distinctly reticulate on the upper surface :
Leaflets subtriplinerved, dull below ; lateral nerves more or less ascending and stout, about 3 pairs, more or less elliptic, 5–10 cm. long, 2–4 cm. broad, the midrib densely pubescent below ; calyx-lobes narrow, tomentellous outside ; petals very narrow 2. *triplinerve*
Leaflets with more or less spreading weak lateral nerves, shining below :
Leaflets rounded or somewhat cordate at the base, 3 pairs, ovate-oblong, acute at the apex, 4–8 cm. long, 2–4 cm. broad, glabrous ; calyx-lobes tomentose ; petals 1·5–1·6 cm. long .. .. 3. *polyanthum*
Leaflets subacute at the base, oblong or elliptic-oblong, shortly acuminate, rounded or subacute at the base, 5–7 cm. long, 2–4 cm. broad, more or less pubescent on the nerves below ; calyx tomentose, 3 mm. long ; petals 1·5 cm. long 4. *Reynoldsii*
Midrib of leaflets glabrous beneath ; leaflets broadly elliptic, slightly pointed, 7–12 cm. long, 3·5–7 cm. broad, firm, loosely reticulate below ; flowers densely glomerate in the axils of the leaves, tomentellous in bud .. .. .. 5. *heterophyllum*

1. **Spiropetalum Solanderi** *Gilg* in Engl. Bot. Jahrb. 23 : 214. *Rourea Solanderi* Bak.—F.T.A. 1 : 456. *Santalodes Solanderi* O. Ktze. A climbing shrub ; fruits curved, brown-velvety.
Sierra Leone : Pujehun (Apr.) ! ? locality ! Liberia : White Plains, St. Paul's River ! Exsicc.—*Afzelius. Smythe* 108. *Dinklage* 2198. *Aylmer* 69.

2. **Spiropetalum triplinerve** *Stapf* in Journ. Linn. Soc. Bot. 37 : 93. A shrub with nearly coriaceous leaves and whitish flowers in dense brown-velvety clustered racemes.
Liberia : Monrovia ! Fishtown ! Exsicc.—*Whyte. Dinklage* 1751 ; 1830.
3. **S. polyanthum** *Gilg* in Notizbl. Bot. Gart. Berlin 1 : 69. A lofty climber with blackish branchlets climbing by means of the inflorescence ; flowers in brown-tomentose dense fascicled racemes.
S. Nigeria : Victoria ! Extends to Gabon. Exsicc.—*Preuss* 1321.
4. **S. Reynoldsii** *Schellenb.* in Engl. Bot. Jahrb. 55 : 451. *Connarus Reynoldsii* Stapf 592. An ornamental shrub with 7–9 coriaceous leaflets and ample panicles of creamy flowers.
Liberia : St. Paul's River ! Ivory Coast : Cavally River ! Exsicc.—*Reynolds. Chev.* 19824B.
5. **S. heterophyllum** *Gilg* in Engl. l.c. 23 : 214. *S. odoratum* Gilg. *Rourea heterophylla* Bak.—F.T.A. 1 : 456 ; Chev. Bot. 165. *Santalodes Bakeri* O. Ktze. A lofty climber with white flowers in crowded brownish-tomentose racemes.
Sierra Leone ! Liberia : Fishtown (Aug.) ! Monrovia ! Ivory Coast : Grand Bassam ! Bingerville : Cavally Basin, Tépos country. Gold Coast : Tarkwa, Bonsa R. (Aug.) ! S. Nigeria : Degema ! Eket ! Calabar ! Extends to Gabon. Exsicc.—*Afzelius. Dinklage* 1971 ; 2019 ; 2701. *Middleton. Vigne* 139. *Talb.* 3075a ; 3349 ; 3705. *Williams* 13 ; 17 ; 33.

11. CONNARUS Linn.—F.T.A. 1 : 456.

Leaflets more than 3 :
Leaflets narrowly oblong to oblong-elliptic or oblanceolate, rather abruptly acuminate :
Leaflets subopposite, 3–5 pairs, rather long-acuminate, rounded at the base, very variable in size, up to 16 cm. long and 6 cm. broad, at first thinly pubescent below, with about 10–12 pairs of slender prominently looped lateral nerves ; petiolule transversely wrinkled ; flowers in very long and lax rusty-pubescent panicles ; sepals imbricate, narrowly oblong, 1·5 mm. long ; petals oblanceolate, 6 mm. long, pubescent ; fruits stipitate, obliquely obovate, closely striate, about 2–2·5 cm. long, tomentose on the back .. .. 1. *Griffonianus*
Leaflets 3 pairs, elliptic, slightly pointed, 6–9 cm. long, 3–4 cm. broad, glabrous, with about 6 pairs of lateral nerves ; flowers in short panicles ; sepals 3 mm. long ; petals slightly pubescent ; fruits as above but smaller and quite glabrous 2. *Thonningii*
Leaflets ovate, 4–5 pairs, gradually long-acuminate, 8–14 cm. long, 5–6·5 cm. broad, glabrous, with 4–5 pairs of lateral nerves, scarcely reticulate ; panicles rather long ; sepals and petals slightly pubescent ; fruits narrowly ovoid, shortly stipitate, 6 cm. long, glabrous .. .. 3. *Staudtii*
Leaflets 3, elliptic to obovate, more or less gradually acuminate, up to 18 cm. long and 10 cm. broad, with about 5 pairs of lateral nerves ; inflorescence short ; sepals and petals much broader than in preceding species ; fruits obliquely oblanceolate, about 6 cm. long, glabrous .. .. 4. *africanus*

1. **Connarus Griffonianus** *Baill.* Adans. 7 : 235. *C. Smeathmannii* Bak.—F.T.A. 1 : 458, not of DC. *C. macrothyrsus* Gilg. *Manotes Staudtii* Gilg. A woody climber with rusty-pubescent branchlets and inflorescence.
S. Nigeria : Oban ! Wumuye (Jan.) ! Fernando Po (Dec., Feb.) ! Also in Cameroons and Gabon. Exsicc.—*Mann* 7 ; 427. *Talb.* 503 ; 1295 ; 1296 ; 1298 ; 1765. *Thomas* 2178.
2. **C. Thonningii** *Schellenberg* in Engl. Bot. Jahrb. 58 : 224. *C. floribundus* Schum. & Thonn.—F.T.A. 1 : 457, partly. *Omphalobium Thonningii* DC. A woody climber.
Gold Coast : Cape Coast. Togo : near Lome ! Gbele ! Exsicc.—*Thonning. Brass. Warnecke* 446 ; *Busse* 3626.
3. **C. Staudtii** *Gilg* in Engl. Bot. Jahrb. 23 : 208. *C. odoratissimus* and *C. macrourus* Gilg, names only. A shrub or small tree 15–20 ft. high ; flowers white turning yellowish.
S. Nigeria : Oban ! Also in Cameroons. Exsicc.—*Talb.* 1297 ; 1427.
4. **C. africanus** *Lam.*—F.T.A. 1 : 457 ; Chev. Bot. 165. *C. djalonensis* A. Chev. Bot. 165. *C. nigrensis* Gilg. A shrub 15–20 ft. high, usually climbing, with shining foliage and cream-white flowers turning brownish ; fruits bright red.
From Senegal to Cameroons and St. Thomas Island. Exsicc.—*Don. Barter* 2143. *Mann* 863. *Sc. Elliot* 4657 ; 4698 ; 5603. *Millen* 153. *Elliott* 179. *Furmar* 226 ; 238 ; 361. *Chev.* 12456 ; 18263. (See Appendix).

12. HEMANDRADENIA Stapf in Kew Bull. 1908 : 288.

Leaves unifoliolate, oblong-elliptic, gradually acuminate, rounded at the base, 9–12 cm. long, 3–4·5 cm. broad, thinly appressed-pubescent when young ; lateral nerves 7–8 pairs ; flowers more or less paniculate, 5–7-merous ; sepals valvate, tomentellous, 2 mm. long ; petals linear-oblong, tomentellous, 4 mm. long ; fruits (young) oblong, velvety .. .. *Chevalieri*

H. Chevalieri *Stapf* l.c. ; Chev. Bot. 167. A small tree ; branchlets yellowish-tomentose ; axis of inflorescence flexuous.
Ivory Coast : Cavally Basin, between Tabou and Bériby, on the sea-shore (Aug.) ! Exsicc.—*Chev.* 19943 ; 19968.

13. JOLLYDORA Pierre in Bull. Soc. Linn. Paris 2 : 1233 (1896) ; Gilg in Engl. Bot. Jahrb. 23 : 217 (1896).

Sepals with glandular hairs ; lateral nerves of leaflets subercct, about 15 pairs ; leaflets elliptic-lanceolate, long- and acutely acuminate, cuneate at the base, 14–30 cm. long, 4·5–7 cm. broad, glabrous ; sepals reddish-brown-hairy, glandular-hairy at the apex ; petal 8 mm. long, glabrous .. .. 1. *glandulosa*
Sepals not glandular ; lateral nerves of leaflets more spreading and curved, about 10–12 pairs ; leaflets elliptic-obovate, abrubtly acuminate, 15–30 cm. long and 8–12 cm.

broad, very closely reticulate below and glossy ; inflorescences very short and clustered on the old wood ; sepals imbricate, pubescent, 2 mm. long ; petals linear, 6 mm. long, glabrous ; fruits obovoid, glabrous, 2 cm. long, shortly stipitate
2. *Duparquetiana*

1. **J. glandulosa** *Schellenb.* in Engl. Bot. Jahrb. 55 : 455. A small weak-stemmed tree, 12 ft. high ; flowers yellow, in clustered rusty-villous racemes.
S. Nigeria : Johann-Albrechtshöhe (Dec.) ! Exsicc.—*Winkler* 1092.
2. **J. Duparquetiana** *Pierre* in Bull. Soc. Linn. Paris 2 : 1233. *Connarus Duparquetianus* Baill.—F.T.A. 1 : 457. *Anthagathis monadelpha* Harms. Small tree 12–15 ft. high.
S. Nigeria : Calabar (Feb.) ! Victoria ! Exsicc.—*Mann* 2307. *Winkler* 40b.

110. ALANGIACEAE

Trees or shrubs, sometimes spiny. Leaves alternate, simple ; stipules absent. Flowers hermaphrodite, actinomorphic, in axillary cymes ; pedicels articulated. Calyx truncate or with 4–10 teeth. Petals 4–10, mostly linear, valvate, at length recurved, sometimes coherent at the base. Stamens the same number as and alternate with the petals or 2–4 times as many, free or slightly connate at the base, more or less villous inside ; anthers 2-celled, linear, opening lengthwise. Disk cushion-like. Ovary inferior, 1–2-celled ; style simple, clavate or lobed ; ovule solitary, pendulous. Fruit a drupe crowned by the sepals and disk, 1-seeded. Seeds with the embryo about equal to the endosperm.

A small family formerly included in the *Cornaceae* and found only in the tropics and subtropics of the Old World ; leaves alternate, exstipulate, ovary inferior.

ALANGIUM Lam.—Wangerin in Engl. Pflanzenreich 4 : *Alangiaceae*.

Branchlets glabrous ; leaves ovate-elliptic, very oblique at the base, acuminate, 15–17 cm. long, 9–10 cm. broad, 5-nerved from the base, with slender parallel tertiary nerves, glabrous ; petiole 2·5–3 cm. long, puberulous ; cymes axillary ; peduncle 2–4 cm. long ; flowers about 10 or more ; pedicels jointed at the top, about 4 mm. long ; calyx a mere toothed rim ; petals 1 cm. long, linear from a broader base ; ovary puberulous .. .. *begoniifolium*

A. begoniifolium *Baill.* Hist. des Pl. 6 : 270. *A. begoniifolium* subsp. *eubegoniifolium* Wangerin l.c. 21.
Cameroons Mt. ! Also in French Cameroons, and widely spread in Old World tropics and subtropics. Exsicc.—*Kalbreyer* 148.

111. ARALIACEAE

Mostly woody. Leaves alternate or rarely opposite, simple or compound ; stipules often adnate to the petiole. Flowers hermaphrodite or unisexual, spicate, racemose, umbellate or capitate. Calyx adnate to the ovary, small. Petals valvate or slightly imbricate, usually free. Stamens free, alternate with the petals ; anthers 2-celled, opening lengthwise. Disk epigynous. Ovary inferior, 1- or more-celled ; styles free or connate ; ovules solitary in each cell, pendulous from the inner angle. Fruit a berry or drupe. Seeds with copious endosperm and small embryo.

Superficially resembling the Umbelliferae, but woody with an indehiscent baccate or drupaceous fruit. Mainly in tropical regions but very rare in Africa.

Leaves pinnate ; leaflets softly tomentose with stellate hairs .. .. 1. **Polyscias**
Leaves digitate or digitately lobed ; pedicels not jointed :
Flowers spicate or racemose ; ovary 2-celled .. .. 2. **Cussonia**
Flowers umbellate or capitate ; ovary 5- or more-celled .. .. .. 3. **Schefflera**

1. POLYSCIAS Forst.—F.T.A. 3 : 27, as *Panax*.

Leaflets at most rounded at the base, ovate-elliptic, shortly triangular-acuminate, 7–12 cm. long, 3·5–7 cm. broad, rather thin, puberulous only on the midrib above, softly tomentose with stellate hairs below, with about 10 pairs of faint lateral nerves ; panicles elongate, up to 40 cm. long, softly tomentellous ; lateral branchlets about 3–4 cm. long ; flowers pedicellate ; ovary glabrous .. .. .. 1. *fulva*
Leaflets deeply cordate at the base, ovate or ovate-oblong, rounded or shortly acuminate at the apex, up to 15 cm. long and 10 cm. broad, leathery, densely tomentose below, with about 10 pairs of lateral nerves ; panicles up to 50 cm. long, softly tomentose ; lateral branchlets about 10–12 cm. long ; flowers sessile ; fruits glabrous or nearly so, ellipsoid, 5 mm. long, ribbed .. .. 2. *ferruginea*

1. **Polyscias fulva** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. *Panax fulvum* Hiern—F.T.A. 3 : 28. A tree 30-40 ft. high, the branchlets, etc., yellowish stellate-tomentose.
Fernando Po, 1,300 ft. ! Also in French Cameroons and Uganda. Exsicc.—*Mann* 301.

2. **P. ferruginea** *Harms* ms. *Panax ferrugineum* Hiern—F.T.A. 3 : 28. *P. nigericum* A. Chev —Chev. Bot. 305. *Polyscius Preussii* Harms. A tree 20 ft. high, stellate-tomentose on the branchlets, etc
French Guinea : Farana, Niger sources (Jan.) ! Cameroons Mt., Buea ! Also in Abyssinia and south to Nyasaland. Exsicc.—*Chev.* 20590. *Preuss* 887.

2. CUSSONIA Thunb.—F.T.A. 3 : 31.

Leaflets shortly acuminate, entire, obovate, subsessile, about 15 cm. long and 7 cm. broad, glabrous and finely reticulate below, with 10–12 pairs of obscure lateral nerves ; spikes catkin-like when young, about 15 cm. long in fruit ; fruits ovate-triangular, acute, about 2 mm. long ; fruits sessile, subglobose, 5 mm. long .. 1. *Barteri*

Leaflets caudate or gradually long-acuminate, more or less toothed :

Leaflets very abruptly acuminate, obovate, about 15 cm. long and 6 cm. broad, subentire or crenulate, very closely and finely reticulate below and with 10–12 pairs of slender lateral nerves ; spikes about 15 cm. long in flower, at length very long ; bracts small and pouch-like ; young fruits obovoid .. 2. *longissima*

Leaflets gradually acuminate :

Fruits about twice as long as broad, narrowed to each end, ribbed, about 8 mm. long ; leaflets obovate-oblanceolate, long-tailed-acuminate, 5–15 cm. long, 2-5 cm. broad, crenate-dentate, finely reticulate below and with about 8 pairs of lateral nerves .. .. 3. *nigerica*

Fruits as broad as long, more or less truncate at the top, about 6 mm. long, slightly angular ; leaflets about 7, obovate or obovate-oblanceolate, gradually caudate-acuminate, cuneate at the base, glabrous, with about 15 pairs of spreading lateral nerves, and finely reticulate below ; petiole up to 25 cm. long ; spikes stout, up to 40 cm. long, the fruits nearly contiguous .. .. .. 4. *djalonensis*

1 **Cussonia Barteri** *Seem.*—F.T.A. 3 : 32. A small tree with very thick branchlets, glabrous except the flower-spikes ; fruits white when ripe.
Dahomey : near Savalou ! N. Nigeria : Borgu ! Exsicc.—*Barter* 815. *Chev.* 23705. (See Appendix).

2. **C. longissima** *Hutch. & J. M. Dalz.* in Kew Bull. 1928, ined. A small tree of the savannahs, glabrous on most parts.
Sierra Leone : ? locality ! Gold Coast : Salaga (June) ! Ashanti : ? locality ! Exsicc.—*Thompson* 61. *Saunders* 805. *Smythe* 267.

3. **C. nigerica** *Hutch.* in Kew Bull. 1910 : 136 ; Holl. 2 : 342. A tree about 15–20 ft. high with thick branchlets and very corrugated bark ; flower-spikes 12 or more inches long, whitish, crowded with the leaves at the end of the branches ; leafless in the dry season.
Gold Coast : N. Terr., Gipala to Kulmasa ! N. Nigeria : Kontagora ! Zaria ! Yola Prov., Kilba (Aug.) ! S. Nigeria : Shigo (Apr.) ! Exsicc.—*Dalz.* 172. *Thompson* 507. (See Appendix).

4. **C. djalonensis** *A. Chev.* in Bull. Soc. Bot. Fr. Mém. 8 : 38 ; Chev. Bot. 305. A tree up to 20–30 ft. high, in appearance like the others ; flower-spikes pubescent.
French Guinea : Boulouloumtou ! Futa Jallon and Upper Niger region, common ! Sierra Leone : Falaba Plateau (Mar.) ! Ivory Coast : Baoulé Nord, between Fétékro and Tiébisson (July) ! Upper Sassandra, between Loucourala and Sanrou. Dahomey : Mts. Atacora, 1,400–1,850 ft. Exsicc.—*Chev.* 22185. *Sc. Elliot* 5735. *Lane-Poole* 38. *Pobéguin* 1981.

3. SCHEFFLERA Forst. Char. Gen. 45, t. 23 (1775).—F.T.A. 3 : 29, as *Heptapleurum* Gaertn. ; Harms in Engl. Bot. Jahrb. 26 : 241.

Leaflets cordate at the base, crenate all round, ovate, acuminate, 14–18 cm. long, 6–12 cm. broad, rather thin, closely reticulate, glabrous ; petiolules 5–7 cm. long ; inflorescences crowded near the apex of the shoot, up to 15 cm. long ; primary bracts large, persistent ; peduncles about 1·5 cm. long ; pedicels about 7, 4–5 mm. long ; receptacle glabrous, broadly turbinate .. .. 1. *Hookeriana*

Leaflets rounded to cuneate at the base, entire or nearly so :

Flowers of the partial umbels pedicellate :

Shrubs or trees ; pedicels and peduncle slender :

Peduncle of umbels longer than the pedicels ; umbels 6- or more-flowered ; leaflets oblong-elliptic, abruptly acuminate, 10–16 cm. long, 5–8 cm. broad, reticulate 2. *Barteri*

Peduncle of umbels shorter or as long as the pedicels ; umbels 4–5-flowered ; leaflets oblong-oblanceolate, abruptly triangular-acuminate, 20 cm. long, 7–8 cm. broad 3. *Baikiei*

Climbers :

Peduncle of the umbels very short, 3–4 mm. long, dense, cone-like when young, about 15 cm. long ; leaflets obovate-elliptic, long-caudate-acuminate, 10–17 cm. long, 5–8 cm. broad, glabrous ; petiolules 2–3 cm. long .. 4. *Hierniana*

Peduncle of umbels about 1–2 cm. long, stellate-tomentellous ; leaflets, etc., very similar to the preceding .. .. 5. *Ledermannii*

Flowers of the partial umbels sessile ; inflorescences numerous and crowded at the top of the shoots, up to 25 cm. long ; peduncles about 1 cm. long ; leaflets oblong-lanceolate, gradually acuminate, 10–15 cm. long, about 4 5 cm. broad, glossy above 6. *Mannii*

1. **S. Hookeriana** *Harms* in Engl. Pflanzenfam. 3, 8 : 38. *Heptapleurum elatum* Hiern—F.T.A. 3 : 30. A glabrous tree 50–60 ft. high, with very stout branchlets and inflorescence composed of small umbels in crowded panicles.
Cameroons Mt., 7,500 ft. (Feb.) ! Exsicc.—*Mann* 1181. *Kalbreyer* 124.
2. **S. Barteri** *Harms* l.c. 38. *Heptapleurum Barteri* Hiern—F.T.A. 3 : 30. *H. dananense* A. Chev. Bot. 305. A small glabrous tree with habit of the preceding.
Sierra Leone : Sugarloaf Mt. (Apr., May) ! Ivory Coast : Dyola country, near Danané (Apr.) ! S. Nigeria : Oban ! Exsicc.—*Barter* (no number). *Sc. Elliot* 5828. *Talb.* 462 ; 1735. *Chev.* 21275.
3. **S. Baikiei** *Harms* l.c. 38. *Heptapleurum Baikiei* Hiern—F T.A. 3 : 30. A glabrous tree, 20 ft. high ; fruits white when ripe.
S. Nigeria : Brass ! Exsicc.—*Barter* 1851.
4. **S. Hierniana** *Harms* l.c. 38. *Heptapleurum scandens* Hiern—F.T.A. 3 : 30, not of Seem. A climbing shrub ; inflorescence 4–5 in. long, densely brown-tomentose when young.
Cameroons Mt., 4.500 ft. (Feb.) ! Exsicc.—*Mann* 1180.
5. **S. Ledermannii** *Harms* in Engl. Bot. Jahrb. 53 : 359.
Fernando Po : grass lands of Moka, 3,800–5,600 ft. (Nov.) ! Also in French Cameroons. Exsicc.—*Mildbraed* 7107.
6. **S. Mannii** *Harms* l.c. 36. *Heptapleurum Mannii* Benth. & Hook. f.—F.T.A. 3 : 31. A glabrous tree, 40–50 ft. high.
Cameroons Mt., 4,500–7,500 ft. ! Fernando Po, 5,000 ft. ! Exsicc.—*Mann* 289 ; 1182 ; 2168.

112. UMBELLIFERAE

Herbs or rarely somewhat woody, with furrowed stems and broad soft pith. Leaves alternate, usually much divided, rarely peltate, sheathing at the base. Flowers hermaphrodite or unisexual, in simple or compound umbels, or rarely capitate. Calyx adnate to the ovary, 5-lobed. Petals 5, free, valvate or slightly imbricate, epigynous. Stamens 5, free, alternate with the petals ; filaments inflexed in bud ; anthers 2-celled, opening lengthwise. Ovary inferior, 2-celled ; styles 2 ; ovules solitary in each cell, pendulous. Fruit dry, 2-celled, dividing into 2 mericarps ; carpels usually ribbed and often with parallel resinous canals (vittae). Seeds with copious endosperm and minute embryo.

A very homogeneous family, at once recognised by its habit, broad pith, umbellate flowers, free petals, and inferior 2-celled ovary, very abundant in the warm temperate regions of the Northern Hemisphere, rare in the tropics.

Besides the following, Engler mentions (Veg. der Erde 3, 2 : 821) a species of *Erythroselinum* (*E. lefeburioides* Engl., formerly *Malabaila lefeburioides*) of which we have not been able to find a description. It occurs at Buea, on the Cameroons Mt., and in the highlands of Mpororos and the Masai highlands, East Africa.

Flowers umbellate or in a loose more or less globose head (not in a cylindrical spike) :
Fruits neither echinate nor covered with long slender hairs :
Leaves more or less orbicular, at most slightly lobed .. .. 1. **Hydrocotyle**
Leaves not orbicular, usually much divided :
Fruits laterally compressed, not broadly winged ; leaves simply pinnate :
Pedicels long and very slender ; fruits narrowly ovoid, longer than broad 2. **Cryptotaenia**
Pedicels short ; fruits broadly ellipsoid, nearly as broad as long 3. **Pimpinella**
Fruits dorsally compressed ; leaves simply pinnate or bipinnate :
Fruits not winged ; leaves much divided into linear segments 4. **Physotrichia**
Fruits broadly winged :
Wings of the fruit without a sinus at the top .. .. 5. **Peucedanum**
Wings of the fruit with a deep sinus at the top .. .. .. 6. **Lefeburia**
Fruits echinate or covered with very long slender bristly hairs :
Bristles on the fruits neither barbate nor hooked ; leaves bipinnate with short linear segments .. .. 7. **Ammodaucus**
Bristles on the fruits hooked or barbate :
Leaves digitately divided into 3–5 obovate segments ; bristles on the fruits hooked 8. **Sanicula**
Leaves bipinnately divided into numerous small leaflets ; bristles on the fruits barbate at the top .. .. 9. **Caucalis**
Flowers in a dense cylindrical spike surrounded by leafy spiny-toothed bracts ; radical leaves simple .. .. 10. **Eryngium**

1. HYDROCOTYLE Linn.—F.T.A. 3 : 3.

Leaves attached at the base (not peltate) :
Umbels sessile or subsessile ; leaves orbicular, shallowly and crenately 6–9-lobed, scarcely 1 cm. diam., glabrous except near the petiole ; stipules large, membranous ; bracts linear ; fruits with conspicuous primary ridges .. .. .. 1. *monticola*
Umbels pedunculate :
Leaves up to 2 cm. diam., crenately and rather deeply 5–7-lobed, pilose-setose ; stipules ovate, 2 mm. long ; bracts very small ; fruits very small, with conspicuous primary ridges ; peduncle about 1 cm. long, pubescent .. 2. *Mannii*

Leaves 3–5 cm. diam., crenate or dentate but not lobulate, glabrous or rather thinly pilose; stipules broad and rather large; bracts inconspicuous; fruits widely orbicular, about 2·5 mm. diam., nervose and reticulate; peduncle 5–8 mm. long, pubescent .. .. 3. *asiatica*

Leaves peltate, orbicular, up to 12 cm. diam., doubly crenate or dentate, many-nerved, glabrous; petiole very variable in length; stipules soon falling off; umbels compound; bracts lanceolate; flowers monoecious or polygamous; fruits widely suborbicular, emarginate at each end .. .. 4. *bonariensis*

1. **Hydrocotyle monticola** *Hook. f.* in Journ. Linn. Soc. 7 : 194. *H. americana* var. *monticola* Hiern—F.T.A. 3 : 4. *H. americana* Chev. Bot. 303, not of Linn. A small creeping herb, nearly glabrous.
French Guinea: Futa Jallon, Ditinn and Diaguissa (Apr.)! Fernando Po, 8,500 ft.! Exsicc.—*Mann* 1456. *Chev.* 12840.
2. **H. Mannii** *Hook. f.* l.c. *H. moschata* Hiern—F.T.A. 3 : 5, not of Forst. A more or less pilose creeping herb.
Fernando Po, 7,000 ft.! Exsicc.—*Mann* 1457.
3. **H. asiatica** *Linn.*—F.T.A. 3 : 6; Chev. Bot. 303. A creeping plant, with a perennial rootstock.
French Sudan: Négala! Senegal: Carabane! Sierra Leone! Ivory Coast: Tabou! Togo! N. Nigeria; Bauchi Plateau, Naraguta! Jos! Vom! Widely spread in the tropics and subtropics.
4. **H. bonariensis** *Lam.*—F.T.A. 3 : 4; Stapf 608; Chev. Bot. 303. A glabrous creeping plant; flowers whitish, numerous; peduncles sometimes a foot long.
Common on sand, usually near the sea! Widely spread in tropical Africa and America.

2. CRYPTOTAENIA DC. Coll. Mém. 5 : 42 (1829).

Radical leaves 3–5-foliolate; petiole and rhachis rusty-pilose; leaflets broadly ovate, cordate, 2·5–5 cm. long, irregularly dentate or trilobed, setulose; cauline leaflets becoming linear-lanceolate; umbels with 3–4 primary and 3–5 secondary rays, paniculately arranged; involucel absent; pedicels slender, 1·5–2·5 cm. long; flowers very small; fruit narrowly ovoid, 5 mm. long, with 2 vittae alternating with the primary ridges .. .. *africana*

C. africana *Drude* in Engl. & Prantl, Pflanzenfam. 3, 8 : 189. *Anthriscus africana* Hook. f.—F.T.A. 3 : 16. Herb 3–4 ft. high, with rather stout rusty pilose pithy branches; pedicels slender, thread-like.
Cameroons Mt., 4,000–7,000 ft. (Dec.–Feb.)! Also in Uganda and Nyasaland. Exsicc.—*Mann* 1234, 2023.

3. PIMPINELLA Linn.—F.T.A. 3 : 13; Norman in Journ. Linn. Soc. Bot. 47 : 583.

Leaflets ovate-orbicular, rounded at the apex, the terminal one about 1·5 cm. diam., crenate-dentate, the lateral ones much smaller and sessile, slightly pubescent on the radiating principal nerves; petiole broadly sheathing at the base; umbels about 6-rayed; ultimate peduncles 1–1·5 cm. long, puberulous; pedicels very short; fruits ovoid-oblong, 2·5 mm. long, glabrous .. .. .. 1. *oreophila*

Leaflets ovate-lanceolate, acute, the lowest pair the largest, stalked, about 3 cm. long and 1·5 cm. broad, sharply serrulate, slightly pubescent on both surfaces; petiole with a very narrow sheathing base; umbels about 6-rayed, ultimate peduncles very slender, about 2 cm. long; ovary (and probably fruit) whitish-pubescent 2. *praeventa*

1. **P. oreophila** *Hook. f.*—F.T.A. 3 : 14; Norman l.c. 588. A small herb 2–12 in. high with a narrow tap-root in the upper grass lands.
Cameroons Mt., 10.000 ft. (Dec.)! Fernando Po: top of Clarence Peak (Jan.)! Also in Abyssinia. Exsicc.—*Mann* 1291; 2028. *Dalz.* 8331.
2. **P. praeventa** *Norman* l.c. 591. A graceful herb about 1–3 ft. high with very slender peduncles and small white flowers.
N. Nigeria: Bauchi Plateau, 3,000–4,500 ft.! Exsicc.—*Dent-Young* 107.

4. PHYSOTRICHIA Hiern in Journ. Bot. 11 : 161 (1873).

Cauline leaves few, scattered; petiole flat, dilated into a rigid amplexicaul sheath at the base; blade 3–5-pinnatisect, segments all narrow, elongated, fleshy, acute, 3–5 cm. long; involucral bracts numerous, narrow, linear, with white margins, acute, up to 3 cm. long, 3–4 mm. broad at the base; rays about 20, unequal; umbellules 10–20-flowered; fruit subterete, compressed on the back, densely papillose, densely and shortly villous .. .. *diplolophioides*

P. diplolophioides *Wolff* in Engl. Bot. Jahrb. 57 : 230. Woody at the base, about 6 ft. high, with elongated suberect branches.
Togo: Sokode-Basari (fr. Nov.). Exsicc.—*Kersting* 515.

5. PEUCEDANUM Linn.—F.T.A. 3 : 18.

Leaves simply pinnate; leaflets ovate or ovate-lanceolate:

Leaflets slightly denticulate or subentire, ovate-lanceolate, very acutely acuminate, 6–15 cm. long, 2–7 cm. broad, glabrous, with numerous pairs of lateral nerves; petiolules nearly 1 cm. long; petioles cupular at the base; primary umbels about 12-rayed, secondary (when present) about 6–9-rayed; ultimate peduncles about 3 cm. long; pedicels numerous, 5 mm. long; fruits obovate, 1 cm. long, 7 mm. broad, 3-ribbed .. .. 1. *araliaceum*

Leaflets dentate with long-acuminate teeth, broadly ovate, very acutely acuminate, up to 14 cm. long and 8 cm. broad, glabrous, with 5–8 pairs of lateral nerves;

petiolules up to 2·5 cm. long; petioles broadly sheathing at the base; inflorescence and fruits similar to above .. .. 2. *fraxinifolium*

Leaves bipinnate; petiole much shorter than the blade, with a broad thin sheath at the base; leaflets oblong or oblong-oblanceolate, acute, up to 2 cm. long, coarsely and acutely crenate, venose, glabrous; bracts leafy; ultimate peduncles slender, about 1·5 cm. long; fruits elliptic, 3-ribbed, broadly winged, 1 cm. long, 7 mm. broad .. .. 3. *Petitianum*

1. **Peucedanum araliaceum** *Benth. & Hook. f.*—F.T.A. 3 : 21. *P. atacorense* A. Chev. Bot. 304. A small slender tree up to 18 ft. high.
Togo: Sokode-Basari ! Dahomey: Atacora Mts., 1,000–1,800 ft. (June) ! N. Nigeria: Katagum ! Nupe ! Extends to Abyssinia and E. Africa; also in French Cameroons. Exsicc.—*Kersting* A. 706. *Dalz.* 343. *Chev.* 24095. (See Appendix).
2. **P. fraxinifolium** *Hiern*—F.T.A. 3 : 22; Chev. Bot. 304. A glabrous tree, 25 ft. high, with compound umbels of small white flowers.
French Guinea to N. Nigeria and throughout tropical Africa. Exsicc.—*Dawe* 499. *Poéguin* 242. *Lely* 699. (See Appendix).
3. **P. Petitianum** *A. Rich.*—F.T.A. 3 : 20. *P. Winkleri* Wolff. A herb.
Fernando Po, 9,500 ft. (Dec.) ! Cameroons Mt., 7,000–10,000 ft. Also in E. Africa. Exsicc.—*Mann* 608. *Johnston* 20.

6. LEFEBURIA A. Rich.—F.T.A. 3 : 23.

Leaflets narrowly lanceolate, acute, 4–8 cm. long, 0·5–1·3 cm. broad, rather distantly serrulate, glabrous; umbels about 10-rayed; umbellules about 8-rayed; pedicels 2–4 mm. long; young fruits glabrous .. .. 1. *angustisecta*

Leaflets broadly lanceolate to broadly obovate, acute, 5–10 cm. long, 2–6 cm. broad, remotely crenate or crenulate, with ascending nerves, glabrous; umbels 8–10-rayed; pedicels 3–4 mm. long; fruits not seen .. .. 2. *Nigeriae*

1. **L. angustisecta** *Engl.* in Pflanzenw. Afr. 3, 2 : 829. A herb 2–5 ft. high; flowers sometimes wine-coloured.
N. Nigeria: Vom, 3,000–4,500 ft. ! Cameroons Mt.: Buea ! Exsicc.—*Preuss* 969. *Dent-Young* 108.
2. **L. Nigeriae** *Wolff* in Engl. Bot. Jahrb. 57 : 233. A glabrous celery-like herb, 4–5 ft. high.
N. Nigeria: Kilba (July) ! Exsicc.—*Dalz.* 90.

7. AMMODAUCUS Coss. & Dur.

A small annual with a slender tap-root; leaves bipinnate; segments linear, rather thick, glabrous; umbels about as long as the leaves; pedicels about 0·5–1 cm. long; fruits about 1 cm. long, densely covered with long slender whitish bristles *leucotrichus*

A. leucotrichus *Coss. & Dur.*—Chev. Bot. 305; Engl. Pflanzenw. Afr. 3, 2 : 832. Erect herb with white flowers.
Mauritania ! French Sudan: Timbuctu, etc. ! Also in North Africa from the Canaries to Egypt. Exsicc. —*Chev.* 28851, etc. (See Appendix).

8. SANICULA Linn.—F.T.A. 3 : 8.

Radical leaves long-petiolate, palmately divided nearly to the base into 5 obovate lobes about 4 cm. long, sharply crenate, glabrous; cauline leaves gradually becoming smaller and bract-like; heads small, few-flowered; bracts lanceolate; fruit densely covered with hooked bristles .. .. *europaea*

S. europaea *Linn.*—F.T.A. 3 : 8. *S. europaea* var. *elata* Wolff. A glabrous shining herb 1–3 ft. high; in the mountain forest.
Cameroons Mt., 4,000–7,000 ft. ! Fernando Po, 4,000–7,500 ft. ! North and south temperate regions and mountains of the tropics. Exsicc.—*Mann* 587; 1233; 2019.

9. CAUCALIS Linn.—F.T.A. 3 : 25.

Leaves bipinnately divided into small coarsely serrate leaflets; petiole sheathing and membranous at the base; umbels head-like on long slender tomentose peduncles; bracts lanceolate, 3–4 mm. long, densely ciliate; fruits about 5 mm. long, densely clothed with bristles armed at the apex with reflexed barbs .. .. *melanantha*

C. melanantha *Benth.*—F.T.A. 3 : 26. *Torilis melanantha* Vatke. A herbaceous plant up to 6 ft. high, with a tap-root; in the upper grass lands.
Cameroons Mt., 7,000–9,000 ft. (Jan.) ! Fernando Po, 7,000 ft. ! Also in East Tropical Africa, south to Nyasaland. Exsicc.—*Mann* 317; 1243; 2008. *Johnston* 76. *Dunlap* 37.

10. ERYNGIUM Linn.—F.T.A. 3 : 6.

Herb with large oblanceolate sharply toothed radical leaves up to 30 cm. long; stem leaves much smaller and very sharply toothed, glabrous; involucral bracts leafy, linear-lanceolate, about 3 cm. long; flower-spikes cylindric, 1–1·5 cm. long *foetidum*

E. foetidum *Linn.*—F.T.A. 3 : 6; Chev. Bot. 303.
A native of tropical America, naturalised here and there in the area and in St. Thomas and Princes Islands, and Uganda. Exsicc.—*Dawe* 478. *Dalz.* 108. (See Appendix).

END OF VOL. 1.